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MEMBER OF THE A. B. C.

FORTY-NINTH YEAR

PAPER TRADE JOURNAL

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ESTABLISHED IN 1872

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Our manufacturing facilities are at your service in solving your paper problems. Paper and Cardboards.
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PAGE 55!

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EVERY DESCRIPTION
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CHICAGO
BOOK AND COATED PAPER
Car Lot and Tonnage Contracts

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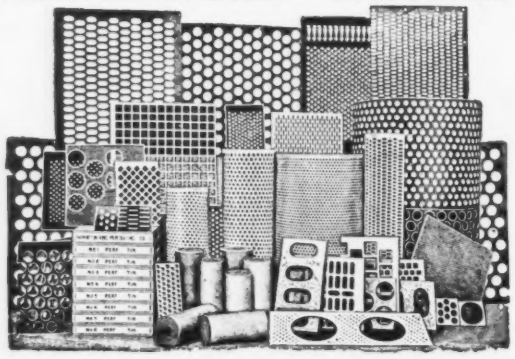
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All sizes and shapes of holes in many thicknesses and dimensions of sheets.
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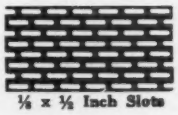

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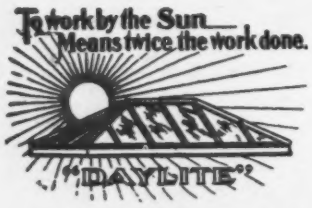

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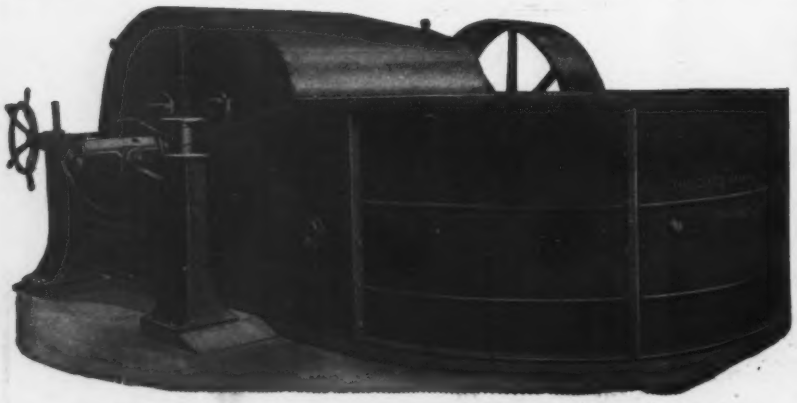

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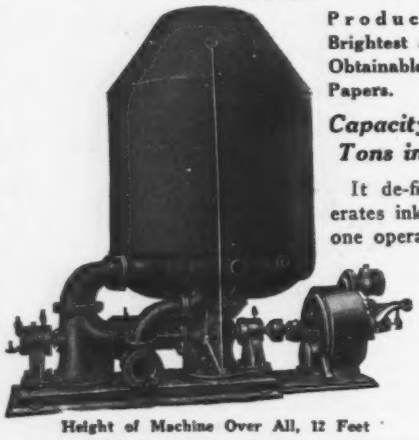
PATENTED



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Capacity—12 to 15 Tons in 24 Hours

It de-fibers and liberates ink and color in one operation. It separates ink and color from fibers, instead of rubbing, grinding or kneading them in.

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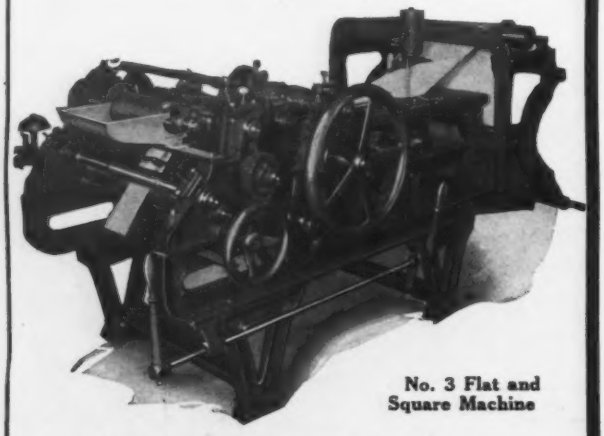

No. 3 Flat and Square Machine

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PHILADELPHIA, PA., U. S. A.

CIRCULAR STOCK DIES

for immediate shipment

Every die is flawless, from its clean-cutting edge to its base and we guarantee it in every way.

Height	2″	2¼″	2½″	3″
Diam.	1″	5″	8″	12″
"	1⅛″	5⅛″	8⅛″	12¼″
"	1¼″	5¼″	8¼″	12½″
"	1⅜″	5⅜″	8⅜″	12¾″
"	1½″	5½″	8½″	13″
"	1⅝″	5⅝″	8⅝″	13¼″
"	1¾″	5¾″	8¾″	13½″
"	1⅞″	5⅞″	8⅞″	13¾″
"	2″	6″	9″	14″
"	2⅛″	6⅛″	9⅛″	14¼″
"	2¼″	6¼″	9¼″	14½″
"	2⅜″	6⅜″	9⅜″	14¾″
"	2½″	6½″	9½″	15″
"	2⅝″	6⅝″	9⅝″	15¼″
"	2¾″	6¾″	9¾″	15½″
"	2⅞″	6⅞″	9⅞″	15¾″
"	3″	7″	10″	16″
"	3⅛″	7⅛″	10⅛″	16¼″
"	3¼″	7¼″	10¼″	16½″
"	3⅜″	7⅜″	10⅜″	16¾″
"	3½″	7½″	10½″	17″
"	3⅝″	7⅝″	10⅝″	17¼″
"	3¾″	7¾″	10¾″	17½″
"	3⅞″	7⅞″	10⅞″	17¾″
"	4″	----------	11″	18″
"	4⅛″	----------	11⅛″	----------
"	4¼″	----------	11¼″	----------
"	4⅜″	----------	11⅜″	----------
"	4½″	----------	11½″	----------
"	4⅝″	----------	11⅝″	----------
"	4¾″	----------	11¾″	----------
"	4⅞″	----------	11⅞″	----------

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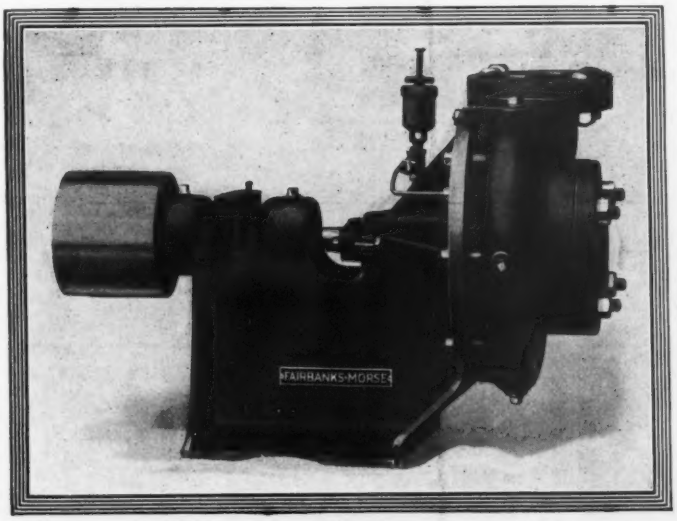

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Fairbanks-Morse pumps will give you high efficiency whatever the job—there is a type for practically every service, each one the embodiment of the essentials that make for high efficiency.

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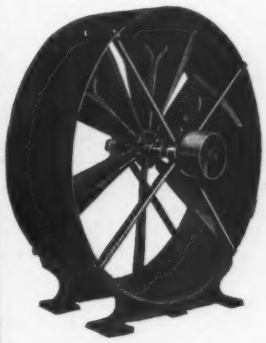

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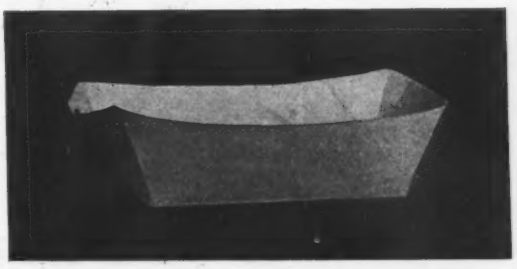

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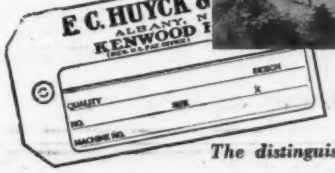

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THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY

FORTY-NINTH YEAR

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Table of Contents

News of the Trade:

	PAGE
Paper Mill Superintendents Meet in New York	16
Those Who Attended Superintendents' Convention	20
The Development of Suction Rolls	22
Human Engineering in Paper Making	25
Care of Wood Room Equipment	27
Beaver Board Co. Pays to Niagara Wall Board	29
Beating	30
Dyes Used in Paper Making	31
Development of the Electrical Drive	33
Development of Pulp and Paper Mill Screens	35
Manufacture of Sulphite Pulp in Europe	37
Cooking of Sulphite Pulp	38
Rubber Rolls	40
Why?	43
Press Room Requirements	44
The Permanency of the Paper Industry	46
Them Damned Chemists and Engineers	48
Bleaching of Sulphite Pulp	51
Paper Mill Operations	52
Cauterizing Problems in a Sulphite Mill	53
Pulpwood Limits Will Last for Years	54
Manufacture of Coated Paper	56
The South as a Source of Paper	58
New York Trade Jottings	70
Paper Demand in Toronto Is Good	72
Strikers Return to Work at Northern Paper Mills	74
Open Price Associations	79
Manufacture of Paper and Wood Pulp	79
F. Pagenstecher to Head Bryant Paper Co	80
Labor Trouble in Canada Straightening Out	82
The Price of News Print	82
New Paper Mill Near Winnipeg	82
Affairs of the Riordon Co	82
Crown Timber in Quebec Province	84
Technical Section's Summer Meeting	84
Edward Beck Arrives in Stockholm	84
Paper Company Appeals Judgment	84
Prairie Mills to Be Enlarged	84
Coast Lumber Business Active	84
Improvement Continues in Philadelphia	86
Paper Demand in Chicago Still Quiet	88
Imports of Paper into India	94
Paper Specifications Report Postponed	94
Imports of Paper and Paper Stock	96
Exports of Paper and Paper Stock	96
Paper and Prohibition	96
Who Can Answer These Questions?	96

Editorial:

Meeting Competition	78
Solution of the Credit Situation	78

Obituary:

Henry Goethe	90
George E. Bellott	90

Market Review:

New York Market Review	94
Market Quotations	95
Miscellaneous Markets	98

Want and For Sale Advertisements, Pages 100, 101 and 103

PAPER MILL SUPERINTENDENTS MEET IN NEW YORK

American Pulp and Paper Mill Superintendents' Association Holds Spring Convention at Waldorf-Astoria—New Officers Elected—Many Interesting Papers Read Showing Development and Offering Solution to Problems in Every Field of Paper Production—Entertainment Given Friday Night and Senator Willis Speaks on Americanism at Banquet Saturday Night

Discussion of the problems of the paper mill superintendent and the important part he plays in the affairs of the industry together with enjoyable dinners and social functions combined to make the Spring convention of the American Pulp and Paper Mill Superintendents' Association last Friday and Saturday at the Waldorf-Astoria, a highly successful affair from start to finish. The high lights of the production end of paper industry were touched upon and some of the knotty problems of the heads of the mills were helped along toward solution.

JOHN H. O'CONNELL, PRESIDENT

PETER J. MASSEY, TREASURER

Address of the President

The first session opened in the Astor Gallery Friday morning with an address by F. C. Boyce, president of the Association, who spoke as follows:

As you all know, the Paper Mill Superintendents' Organization of America is one of the affiliated organizations of the American Paper and Pulp Association, but we hold our meetings separately.

Members of the American Paper and Pulp Mill Superintendents' Association: Again we are assembled at our semi-

GEORGE K. WALKER, FIRST VICE-PRESIDENT

NELSON R. DAVIS, SECOND VICE-PRESIDENT

A. O. ROLFE, THIRD VICE-PRESIDENT

annual convention. This time we have journeyed to New York, as it appeared to the executive committee that it was the most convenient place for the members of the East and Canada to get to.

We have passed through many trying times since last we met at Chicago, but things have commenced to look brighter, or they did before May 1st, when some of the mills started to adjust the wage scale, but I am sure that the paper trade, as a whole, has not suffered as much as some of the other large lines of industry, for the paper industry is the seventh largest in the United States, and I think very nearly at the top in Canada. We have met as practical paper and pulp mill superintendents in this large industry to talk over the problems which confront us and to devise ways that make for more efficient manufacture of pulp and paper, and I am sure that the superintendents who attend these meetings and the mills they are connected with are going to receive a great amount of good out of them.

The two great problems that confront the paper industry today are wood for the manufacture of paper, and labor represented by the men and women employed in the mills. The mills are stocked and their yards are full of high priced wood, largely due to the wood jobbers getting cheaper labor and shipping every last cord they could on their contracts. As you know, a paper mill has to contract for its wood a year in advance in order to operate the mill successfully. The labor problem has not been entirely adjusted as yet in some of the mills, but I am sure that when the people employed in the mills realize the fact that there has to be a re-adjustment, this will all straighten itself out.

I would like to say a few words in regard to the superintendents. We have been so accustomed to seeing them called upon to perform many and strange duties that only a few of us have taken the trouble to consider the part they play in the constructive economics of our great industry, such as the practical materialization of a one thousand foot machine and the skill with which they have handled the labor problem in the very serious period which the industry has been going through in the last few years. The superintendents of the successful concerns in our industry are all close students of human nature, and have a very intimate understanding of the type of male and female workers found in the pulp and paper mills, and through their skillful handling of the firm's relation with their employees working under their supervision, they have increased the general efficiency of the plant.

In many of the mills, the general policy followed by the company in its relation to its employees, the superintendent is not consulted, and these policies are forced upon the superintendent without giving him a hearing as to the justice or practicability of its application to his particular organization, and the results are the present industrial strife and misunderstanding experienced in many of the mills today, but even under these conditions, the superintendent's loyalty is never questioned, and like a good soldier, he buckles on his armor to fight to a finish and to carry through the orders from his superiors, even though he has nothing to say in the drawing up of these plans. He is on the firing line night and day, taking the entire load of the industrial battle upon his shoulders, fighting the men whom he had known intimately for years and for whom we may have been the advisor in their most intimate financial and family matters, taking all the abuse of the small town that has taken sides with the striking employees, and continues to carry on until sanity and industrial peace return to his community.

You, gentlemen, are your brother's keeper, and you must not only bring along the men in your mill alone, but try to develop any of the weak sisters of your profession with whom you may come in contact, so that they may be fit to exercise the rare judgment, courage and determination required to be a pulp or paper mill superintendent in fact as well as in name. The superintendent is in a position that carries unlimited possibilities as well as unusual responsibilities for the progressive and successful development of our industry, for in most instances, we find that he is the active paper maker of yesterday, in all probability the employer of tomorrow. He has seen many years of active service as a paper maker, having started at the lowest rung of the ladder and reached his present position through his individual efforts to raise the industry to a higher standard by increasing the efficiency of his organization and the equipment with which he is producing paper and pulp, always mindful that the men and women under his jurisdiction are human beings, entitled to all the courteous treatment that the term "square deal" stands for. If you investigate the history of the mills that have succeeded in establishing a standard of quality above the average in the particular grade manufactured for our market, a product that commands a good return from the investment as well as attracting a more desirable and discriminating class of paper buyers, you will find that this success is almost entirely attributable to the good fortune in having a real manager and a real superintendent in these mills. The fact is clearly evidenced by the number of these former superintendents who are now in the employers' class with some title in their respective companies. Good executives contribute to the success of any enterprise, but in our industry they are absolutely indispensable and it is no more than reasonable to expect the paper mill owners to encourage in a substantial manner the organization that is endeavoring to develop a high type of executive who will accept the full responsibilities of directing the operations of our plants, cheerfully carry all the burdens of the manufacturing end of the business so that the owners may not be disturbed or have their attention diverted from their many problems in business getting and finance. In considering the future of our organization, its possibilities for service to its members and for the further development of our industry, we should take into consideration what it has accomplished in the short space of two years so that we may be able to get a clear perspective of what part it will play in the future of our industry.

One of the things you have to do at this meeting is to elect new officers for the coming year, which is one of the great important things for the success of your organization. I feel today like the man who has traveled from east to west, and from west to east again, for this is my native state. A short distance up the historic river which passes by this wonderful city I was born, raised and learned paper making, although I have lived in Wisconsin for the past twenty years and consider myself a native Badger. I am now located on another wonderful river, with its reservoir system of 6219 millions of cubic feet of water storage, whose principal industry is paper making, with its eighteen paper and pulp mills making all of the various grades of paper that are made in this country. On this river the world's record for speed in paper making was made last year, and if all plans are carried out, there will be another record made in the next year in the history of paper making. I refer to the machine which has just been completed by the Beloit Iron Works for the Consolidated Water Power & Paper Company at Wisconsin Rapids, Wisconsin. This machine has already been tested out for a speed of 1,200 feet in the shop, and I have no doubt that it is one of the most wonderful paper making machines that has ever been constructed. It has something

new for changing the wire, as the whole fourdrinier part outside of the couch roll can be removed on tracks without moving a roll by hand. It has been estimated that a wire can be changed on this machine in thirty minutes.

The program which the executive committee has planned for the meeting looks very attractive, and I am sure you will all have a very enjoyable time during the three days that you will spend in New York.

I wish to thank all the members of the executive committee and all the officers and members of the organization for the co-operation they have given their president in the past year, and I bespeak the same cooperation for the officers you will elect for the coming year.

Interesting Paper at Morning Session

William Millspaugh, of the Sandusky Foundry and Machine Company, next spoke interestingly on the development of Suction Rolls. After this Phillips Dennett, of the Bird Machine Company, South Walpole, Mass., spoke on the Development of Pulp and Paper Mill Screens and following him the meeting adjourned for a buffet lunch which was furnished by the Entertainment committee in the corridor and rooms adjoining the Astor Gallery.

Dr. Baker Opens Afternoon Session

The afternoon session opened about 2.30 with an address by Dr. Hugh P. Baker, executive secretary of the American Paper and Pulp Association, who outlined the relationship between the superintendents' organization and the parent association. After this W. W. Cronkhite, of the General Electric Company, delivered a paper on the Development of the Electrical Paper Machine Dive which was illustrated with some instructive stereopticon slides. N. R. Davis took up Paper Mill Operations. The dyes used in paper making were then discussed by K. W. King, of the E. I. Du Pont de Nemours Company and following this W. T. Schenck, of the C. C. Paper Company, Hamilton, Ohio, took up the Manufacture of Coated Paper. The South as a Source of Paper was the next speech and was given by S. D. Wells, of the Forest Products Laboratory and the afternoon session closed with a discussion of Pressroom Requirements by S. M. Williams, of the New York *World*.

PICTURE TAKEN AT THE DINNER OF THE AMERICAN PULP AND PAPER MILL SUPERINTENDENTS ASSOCI

Friday Evening Dinner

A dinner and entertainment took place that night in the Grand Ballroom of the Waldorf-Astoria. Owing to a slight misunderstanding about the time at which the entertainment was to occur there was some delay between the acts at the beginning of the program, but this was effectively filled in by two of the actresses who had already performed, Miss Fern Rogers and Miss May Genese, both musical comedy stars. Much credit is due to both of them for their clever impromptu work. Eleanor Griffith and Harry Fender, who were loaned by the Schuberts, and both of whom are now appearing in the Last Waltz, proved very entertaining and Irene Olson, of the Greenwich Village Beauties, and Phil Baker, of the Greenwich Village Follies, put on some good numbers.

Saturday Morning Session

The Saturday morning session opened a little after 10 a. m. in the Astor Gallery with a talk on Human Engineering in Paper Making by Robert B. Wolf, of the Robert B. Wolf Paper Company. Following him a talk on loading materials was given by Cale B. Forsythe and after this A. D. Wood closed the morning session with a talk entitled "Them Damned Chemists and Engineers."

Election of Officers

Officers were also elected in the morning. John H. O'Connell, of the King Paper Company, was elected president; George K. Walker, of Finch, Pruyn Company, first vice-president; Nelson R. Davis, of S. D. Warren Company, was elected second vice-president, and A. O. Rolfe, of the Champion Coated Paper Company, was made third vice-president. P. J. Massey, of the W. F. Hall Printing Company, was elected treasurer and it was decided that a professional secretary be employed instead of electing one of the members to act in this capacity.

The afternoon session opened with a talk on Causticizing Problems in a Sulphate Mill by Norman E. Brokaw, a consulting engineer. Cooking Sulphite Pulp was the next number on the program and was discussed by B. T. Larrabee. H. L. Whitney took up the subject of Sulphate and Soda Digesters. B. M. Petrie spoke on Bleaching Sulphite Pulp and after this W. J. Orchard, of the G. D. Jenssen Co., N. Y., treated the subject of Bleaching Pulp with Liquid Chlorine. The manu-

NDENT SSOCIATION AT THE SPRING CONVENTION, THE WALDORF-ASTORIA, NEW YORK, JUNE 4, 1921.

facture of Sulphite Pulp in Europe was then taken up by O. L. Berger and the Care of Wood Room Equipment by R. R. Fox. The following papers were on the schedule of the Box Board meeting, which was held along with the other in the afternoon. The Use of Alum in Boxboard, by C. E. Raney; Why? by B. M. Bishop, of the Gardner Harvey Paper Company; the Board Mill, by L. T. Murphy; the Product as an Advertisement, by Max Zimmerman, and Test Board, by John Hercher. With this the last formal session closed.

Banquet Saturday Evening

Senator Frank P. Willis, former governor of Ohio, proved a most interesting speaker at the banquet that night in the Grand ballroom when he set forth the principles of Americanism. He pointed out the dangers of radicalism and scored the professors of some of the colleges and universities of this country for espousing the cause of the extremist. He also discussed the subject of the payment of European loans and remarked that as long as he was down in Washington he would attempt to defeat any measure which would cancel Europe's debts to the United States either in part or as a whole. Judge Charles F. Moore, of the Seaman Paper Company, New York, acted as toastmaster, and he also spoke on the importance of the superintendent to the industry.

Sunday's Outing

On Sunday afternoon an outing to Sheepshead Bay was given for those who desired to attend. Automobiles were furnished for all and the delegates enjoyed a very fine shore dinner at Tappen's well-known restaurant.

THOSE WHO ATTENDED THE CONVENTION

Among those who attended the convention were the following:

M. J. Argy, superintendent, Cliff Paper Company, Niagara Falls, N. Y.

Dr. Hugh P. Baker, secretary American Paper and Pulp Association; Edwin C. Babbitt, sales agent, Union Screen Plate Company, Fitchburg, Mass.; H. B. Barden, H. Wallingford, Diana Paper Company, Harrisville, R. I.; A. L. Beals, Curtis and Brother, Inc., Newark, Del.; F. K. Beitar, Bird Machine Company, South Walpole, Mass.; L. A. Belding, American Welding Company, Carbondale, Pa.; W. M. Benzing, sales manager, The Champion Fibre Company, Canton, N. C.; Samuel J. Baril, New York representative, Maurice A. Knight, Room 404 World Building, New York; O. L. Berger, G. D. Jenssen Company, 200 Fifth avenue, New York; Harold O. H. Bing, Sandusky Foundry and Machine Company, Sandusky, Ohio; Benjamin M. Bishop, Gardner Harvey Paper Company, Middletown, Ohio; J. A. Bowers, Hammermill Paper Company, Erie, Pa.; F. C. Boyer, Wausau Paper Mill Company, Brokaw, Wis.; E. G. Brant, Stewart Adams & Company, 430 Noble street, Chicago; Frank E. Z. Brenner, Opener Bag Company, Decatur, Ill.; L. H. Breyfogle, Draper Brothers Company, Kalamazoo, Mich.; N. E. Brokaw, consulting engineer, Edgerton, Wis.; A. W. Bronk, W. & O. Paper Company, International Falls, Minnesota; Fort Francis Pulp and Paper Company, Ltd.; Walter Bermingham, Bermingham and Prosser, New York; William Brydges, Defiance Paper Company, Niagara Falls, N. Y.; Warren B. Bullock, American Paper and Pulp Association; W. H. Burns, Valley Iron Works Company, Appleton, Wis.; S. V. Burrows, Process Engineers, Inc., 501 Fifth avenue, N. Y.; W. E. Brown, American Wringer Company, Woonsocket, R. I.; R. H. Baker, Taylor, Wharton Steel and Iron Company; Clarence Beebe, Appleton Wire Works, Appleton, Wis.

A. G. Caldwell, Orr Felt and Blanket Company, Holyoke, Mass.; F. E. Caton, Montreal, P. Q.; Fred. Cherrie, Castle, Gottheil & Overton, New York City; A. Chilcott, Continental Paper and Bag Mills, Ashland, N. H.; Wm. B. Clements, Wm. Cabble Wire Manufacturing Company, Brooklyn, N. Y.; John H. Coghlan, Taylor Wharton Iron and Steel Company, 45 Broomfield street, Boston, Mass.; John Cornell, The Paper Mill, New York; M. J. Cornell, Carthage Sulphite Pulp and Paper Company, Carthage, N. Y.; W. H. Croft, Esleeck Manufacturing Company, Turners Falls, Mass.; W. W. Cronkhite, General Electric Company, Schenectady, N. Y.; A. W. Chamberlin, New York *Tribune*, New York City; Gaynor Conlon, The Paper Mill, New York City.

Dan Daserin, Provincial Paper Mills, Ltd., Thorold, Ont.; Nelson R. Davis, S. D. Warren Company, Cumberland Mills, Me.; Phillips Dennett, Bird Machine Company, South Walpole, Mass.; F. J. Dooley, with E. R. Barker, 79 Milk street, Boston, Mass.; W. H. Donaldson, secretary, with R. F. Hammond, 342 Madison avenue, N Y., also Matagami Pulp and Paper Company, Toronto, Ont.; R. L. Draper, Draper Brothers Company, Canton, Mass.; V. S. Denison, Sandusky Foundry and Machine Company, 163 Pineywood, Springfield, Mass.; J. A. DeCew, Process Engineers, Inc., 501 Fifth avenue, New York City; Theodore W. Dunn, Detroit Sulphite Pulp and Paper Company, Detroit, Mich.; M. L. Dinkelspiel, National Paper Products Company, Carthage, N. Y.; S. M. Dauman, Gottesman & Co., Inc., New York; J. W. Dwyer, Jr., Great Northern Paper Company, New York City.

F. L. Edmonds, Wausau Paper Mills Company, Brokaw, Wis.; Charles L. Ellis, 2d., V. P. Downingtown Manufacturing Company, East Downington, Pa.; Geo. C. Emigh, superintendent, York Haven Paper Company, York Haven, Pa.

Jas. Foxgrover, Western Paper Makers Chemical Company, Kalamazoo, Mich.; J. R. Ferguson, Seaman Paper Company, Chicago; Howard S. Foster, Hart Roller Bearing Company, Orange, N. J.; Frank E. Field, Hinsdale Paper Manufacturing Company, Hinsdale, N. H.; Geo. R. Flinn, Gutta Percha and Rubber Manufacturing Company, New York.

A. H. Gere, J. M. Huber, 65 W. Houston street, New York; Frank S. Gardner, sales manager, The A. A. Simonds & Son Company, Dayton, Ohio; A. H. Goodman, Blaw-Knox Company, Pittsburgh, Pa.; Robert M. Guie, Philadelphia Felt Company, Frankford, Philadelphia, Pa.; J. H. Gately, De Grasse Paper Company, Pyrites, N. Y.; L. H. Goebel, Wallace & Tiernan Company, Newark, N. J.; Paul De Guehery, Newport Chemical Works, Newark, N. J.

L. E. Halteman, Dayton Beater and Hoist Company, Dayton, Ohio; Chas. E. Hayden, Chas. E. Hayden Mill and Supply Company, Springfield, Mass.; L. F. Hicks, Daniel M. Hicks, Inc., Hotel Committee; W. H. Hill, Fort Edward, Morton & Hill, Fort Edward, N. Y.; R. W. Howell, R. T. Vanderbilt, 50 E. 42nd street, New York; H. W. Huber, I. M. Huber, 65 W. Houston street, New York; N. C. Hitt, Stamsocott Company, New York.

Roland Jacobus, Mrs. Roland Jacobus, C. T. Jewell, St. Regis Paper Company, Herings, N. Y.; J. I. Jenssen, G. D. Jenssen Company, New York.

Ferdinand A. Kerls, Eastern Manufacturing Company, Lindon, Me.; R. H. Kelly, Marathon Paper Mill Company, Rothschild, Wis.; A. J. Kennedy, The Sandy Hill Iron and Brass Works, Hudson Falls, N. Y.; Thos. N. Keogh, superintendent, Wanaque River Paper Company, Wanaque, N. J.; John Kepke, Jr., S. K. F. Industries, Inc., 165 Broadway, New York; Kenneth T. King, E. I. DuPont de Nemours Company, 1114 Tribune building, Chicago; Samuel Klein, Calco Chemical Company, Bound Brook,

N. J.; Paul Koenig, Continental Paper and Bag Mills, New York; Ralph W. Kumler, Hercules Powder Company, Wilmington, Del.

F. A. Lane, The Kalbfleisch Corporation, New York; E. S. Lansing, Lansing, Bagley E. Sewall Company, Watertown, N. Y.; Benj. T. Larrabee, S. D. Warren & Co., Cumberland Mills, Me.; John Leishman, C. H. Dexter & Sons, Inc., Windsor Locks, Conn.; W. T. Libby, DuPont Dyestuffs; Herbert Lippitt, Brown Company, core department, Portland, Me.; N. J. Livingston, Newton Falls Paper Company, Newton Falls, N. Y.; A. G. Lutz, Invincible Pulp and Paper Corporation, New York.

K. S. Maclachlan, Lincoln Paper Mills, St. Catherines, Ont.; Donald McDonald, Lawless Brothers Paper Mills, East Rochester, N. Y.; L. N. McIntyre, McIntyre Brothers, Fayetteville, N. Y.; Alexander White Macvie, Price & Pierce, Ltd., New York; Leonard Mann, National Aniline and Chemical Company, 21 Burling Slip, New York; Thos. F. Martin, Hammersley Manufacturing Company, Garfield, N. J.; Peter J. Massey, W. F. Hall Printing Company, Chicago; M. Middleton, The Hart Roller Bearing Company, Orange, N. J.; W. H. Millspaugh, Sandusky Foundry and Machinery Company, Sandusky, Ohio; Frank J. Milon, W. C. Hamilton & Sons, Philadelphia; L. O. Moffit, Taylor Wharton Iron and Steel Company, High Bridge, N. J.; John A. Murray, Wm. A. Hardy & Sons Company, Fitchburg, Mass.; Jas. G. McGerry, Vacuum Oil Company, Boston, Mass.; P. H. Moran, Cushnoc and Kennebec Paper Company, Augusta, Me.

Elbert H. Neese, Beloit Iron Works, Beloit, Wis.; T. H. Nevill, Niagara Falls, N. Y.; M. P. Northam, National Fibre and Insulation Company, Yorklyn, Del.

H. E. Obermanns, Hammermill Paper Company, Erie, Pa.; John H. O'Connell, King Paper Company, Kalamazoo, Mich.; J. W. Outerson, Megargee Paper Mills, Modena, Pa.

Frank Peterson, Ulster Tissue Mills, Napanock, N. Y.; Henry W. Pfeffer, American Blower Company, 10 High street, Boston, Mass.; L. D. Post, the Paper Mill, New York; Talcott W. Powell, PAPER TRADE JOURNAL, 10 E. 39th street, New York; Jas. E. Power, Jr., United States Rubber Company, 59 Reade street, New York; Max V. Poyck, The Heller & Merz Company, New York; Geo. E. Pratt, Simonds Manufacturing Company, Fitchburg, Mass.; R. W. Pryor, Jr., Koithan & Pryor, New York.

C. W. Quinn, The Champion Fibre Company.

G. E. Rausch, Pittston Paper Corporation, Pittston, Pa.; Geo. Rayner, St. George Paper Company, Norwalk, Conn.; Walter E. Rapp, Skinner Brothers Manufacturing Company, New York and St. Louis; H. J. Reed, manager, Improved Paper Machine Company, Nashua, N. H.; Homer M. Rice, E. I. DuPont de Nemours, Wilmington, Del.; A. F. Richter, Stebbins Engineering and Manufacturing Company, Watertown, N. Y.; W. M. Rosch, Scottsville Box Board Company, Scottsville, N. Y.; Wm. J. Robertson, Heller & Merz Company, 505 Hudson street, New York; E. H. Romand, representative, S. M. Langstone Company, Camden, N. J.; W. Robertson, Empire Size and Chemical Company, Albany, N. Y.; J. O. Ross, Ross Engineering Company, New York; T. S. Robinson, M. Gottesman & Co., Inc., New York.

Thomas H. Savery, Jr., Nash. Engineering Company, Bird Machine Company, 1718 Republic building, Chicago; Wm. T. Schenk, Champion Coated Paper Company, Hamilton, Ohio; S. E. Seaman, The Stamsocott Company, Hopewell, Va.; George A. Seitz, New York Belting and Packing Company, New York; Frank I. Sheahan, Hart Roller Bearing Company, Orange, N. J.; Geo. F. Shevlin, Glens Falls, N. Y.; J. Schroeter, Prest. Vibrating Machine Company, Chicago; R. G. Simonton, Hollingsworth & Vose Company, West Groton, Mass.; D. A. Smith, vice-president and general manager, D. C. Paper Manufacturing Company, Washington, D. C.; Jack Smith, Gardner & Harvey Company, Middletown, Ohio; Stephen W. Smith, Bird & Son, Inc., East Walpole, Mass.; Ward Smith, superintendent, Philadelphia Paper Manufacturing Company, Manayunk, Philadelphia, Pa.; Charles C. Stewart, Harding Paper Company, Div. H. W. P. Co., Franklin, Ohio; A. J. Sigel, M. Gottesman & Company, Inc., New York.

A. A. Tanyane, 10 E. 39th street, PAPER TRADE JOURNAL, New York; Milton G. Tibbitts, Trimby & Allen, Glens Falls, N. Y.; C. W. Trabue, Republic Rubber Company, 221 W. 37th street, New York; Wm. P. Taylor, Union Sulphur Company, New York; Vincent Thorpe, American Wringer Company, Woonsocket, R. I.

C. W. Ulrich, Wolverine Paper Company, Otsego, Mich.

H. K. Vinton, 431 So. Dearborn street, Chicago, PAPER TRADE JOURNAL.

W. E. Wagg, superintendent, Wm. Mann Company, Lambertville, N. J.; J. M. Ward, treasurer, Detroit Sulphite Pulp and Paper Company, Detroit, Mich.; Chas. E. Weed, superintendent, Fisk Paper Company, Hinsdale, Pa.; H. D. Wells, Trimby & Allen, Glens Falls, N. Y.; John B. West, Tidewater Paper Mills Company, Brooklyn, N. Y.; J. Bertwell White, superintendent, National Fibre and Insulation Company, Yorklyn, Del.; C. W. Whitehouse, sulphite superintendent, Abitibi Power and Paper Company, Ltd., Iroquois Falls, Ont.; Sidney D. Wells, Forest Products Laboratory, Madison, Wis.; T. F. Wood, Tait & Sons Paper Company, Bridgeport, Conn.; H. B. Wadsworth, representative, The Meishocha Company, Ltd., New York; S. M. Williams, New York *World;* R. B. Wolf, R. B. Wolf Company, New York.

Dr. Baker Speaks on Forestry at Dayton

DAYTON, Ohio, June 9, 1921.—"Ohio is recognized as a great steel state. Do you men of Ohio realize that it has more paper mills than either of the great paper making states of Michigan or Wisconsin, and that its mills were operating before there was a mill in either of these great western states?"

This was the question put to the Dayton Chamber of Commerce, when Dr. Hugh P. Baker, executive secretary of the American Paper and Pulp Association, discussed the subject of "The Forest and the Paper Industry of Ohio."

"America's paper industry is in the billion dollar class, the value of its product placing it seventh in the list of American industries, and Ohio has fifty-nine separate mills. The success of any industry is in part dependent upon having its raw material close at hand. You have developed steel mills because you are near the coal and iron mines. And yet with Ohio's great paper industry, largely dependent on imported raw material, millions of acres of land which could be producing timber crops sufficient to operate these mills continuously on native raw material are lying almost idle. This is an economic waste.

"If the land area of Ohio which is better suited to the growing of trees than for agricultural crops were covered with the right kind of forests, properly managed, Ohio would be independent of outside sources of wood for her paper industry. This same forest area might be used to supply lumber for home building and industries dependent upon wood.

"As a result of the excellent work being done by the State Department of Forestry at Wooster, and the Forestry Department of the State University, Ohio for the two year period beginning July 1, will have $10,000 for fire protection, the same for forest nurseries, and $50,000 for the purchase of land for state forests, and $50,000 for the work at the experiment station. It would be a sound investment for the state to put ten times this amount of $120,000 into the development of forest land, which will pay dividends of millions in raw material for Ohio industries, keeping at home great sums now sent out of the state.

"Your paper mill men are doing their share. The American Paper and Pulp Association is working for national forestry legislation, which involves the giving of federal assistance to states which are properly handling their own forest resources.

"You have the opportunity to make these great fast growing cottonwoods of your river valleys, and your other forest trees a tremendously valuable state asset."

THE DEVELOPMENT OF SUCTION ROLLS*

By William Millspaugh of the Sandusky Foundry and Machinery Co. Sandusky, Ohio.

Suction rolls are old in the paper trade. To enumerate the patents granted and attempts made to introduce them would be monotonous and a history of failures. It is worthy of note for its lesson to inventors and experimenters that several of the attempts before the successful ones I made were almost successful—so near in fact, that it seems a bit of perversity that success should have been withheld from the ones responsible and that the benefits to the paper industry should have been so long withheld. No sympathy need be wasted over those designs in which intermittent vacuum is a feature—those having pockets alternately open to the air and to the influence of the vacuum—producing means, as the principle is mechanically incorrect and the operation is predestined to failure or to very limited usefulness. Constant non-pulsating vacuum is essential.

Vacuum is here used as a term expressing the difference in pressures between the atmosphere and that maintained within the area subjected to action of the pump regardless of the difference in pressure.

It developed that the first suction rolls made by the Sandusky Foundry and Machine Company were but modified copies of those designed by Black, Newton, Kenney and others. They had no merit and were distinct failures for the one reason if for no others, that no means were provided to prevent pressure between the packing of the fixed member, (the suction box) and the inner surface of the rotating member.

The first United States suction roll patent issued to me covered means to regulate such pressure, and as far as the suction roll proper is concerned, that was the real start of successful suction roll construction and was the element all former inventors had overlooked.

Following this patented improvement, successful suction rolls were made for many cylinder machines.

The first period of manufacture was uneventful, as nothing remarkable is accomplished through such installations, but the development of a correct design was important and led to the application as a suction couch roll on Fourdrinier machines.

The second period began with the discovery that a large volume of air drawn through the paper uniformly and preferably by an efficient positive rotary pump, would insure success with suction rolls in difficult situations.

To digress, the attempts to get an installation on a Fourdrinier covered a period of nearly two years and is cited with the hope that members of the Superintendents' Association may perhaps be a bit more open minded with the new generation of investigators. No less a person than Mr. Philip Dodge, who is rated a patent authority of first rank, has stated: "It is an outstanding fact that in many of the industries the inventions and processes that have most changed old methods have come from men not identified with the particular industry affected."

A prominent Kalamazoo firm, since then purchasers and for many years users of suction rolls, were offered cash in hand to cover their sales price for a week's run of paper and to cover all other possible expense if they would but allow a trial. This offer was repeatedly made to other friendly mills only to be met by "when our competitors get ahead of us through using suction rolls, come around and see us." "We are from Missouri." "Tell your story to the Marines." Oftener heard than the others was this reply: "We tried one once," or, "we know all about suction rolls."

First Installation by Hamersley Mfg. Co.

The first suction couch roll was installed at the Hamersley Manufacturing Company's mill, at Garfield, N. J., after Christmas 1908, on a machine making "Greaseproof."

During the period February 1 to October 1, 1909, nearly $400,000 worth of contracts were taken and suction rolls were proven a success with sulphite bonds, book, news and various other grades, and the leading European paper machine builders were licensed.

The third period began with the installation of a suction press roll at the first press on a news machine at the mills of Cliff Paper Company, Niagara Falls, N. Y., which proved a success. On the conventional paper machine, the web of paper has been formed either on the cylinder mold or Fourdrinier wire. The function of the suction roll is to assist in removing the water left after formation of the web in the most economical manner. On a cylinder machine, a plain suction roll is often substituted for the flat suction boxes, and the suction roll performs the same service except that higher vacuum may be carried and without wear on the felt. The felt being the medium through which the water is carried away from the paper, the paper and felt must be considered as one when entering the presses. It is obvious that it makes no difference if the water be removed by the suction roll from the felt or paper or both, as the liability to crush at the press is reduced.

The First Few Years

For the first few years, we manufactured suction rolls for use only as above described. Suction couch rolls in place of the two conventional couch rolls were the subject of patents and were tried before the Sandusky Foundry and Machine Company's successful attempt at Garfield. The attempts were not satisfactory for two reasons: Structural defects of the suction roll and lack of understanding of the problem of removing water from the paper by vacuum. I discovered that a large volume of air passing through the sheet of paper uniformly removed much of the moisture that had been left in the paper by previous experimenters. The water is removed by combination of three means: First, direct pressure on the paper equalling the difference in pressure between that maintained in the suction box and atmospheric pressure outside; second, by physical contact of the air passing at high speed through the paper with the water, thus atomizing a portion of the water, carrying it forward with the air; and third, by actual absorption of the moisture in the paper by the air passing through the sheet, the air being considered as a sponge or blotter. Ample evidence of this triple effect has been noted. Dried and heated air drawn through the paper at the couch in place of the cold moist air from the machine, works decidedly better than the cold moist air. Further reference to this fact will be made.

To provide the large volume of air required with reciprocating pumps, would have been expensive for installation and operation, while a positive rotary pump having the necessary capacity was found both efficient and low in installation cost. The combination of suction rolls with positive rotary pumps was, therefore, patented and the general adoption of rotary vacuum pumps in paper mills dates from the first installation at Hamersley Manufacturing Company's plant.

Conforms to Natural and Mechanical Laws

It will be noted that the operation of a suction couch roll, as above described, conforms to natural and mechanical laws. The old fashioned couch pressed the paper into the wire imprinting the figure of the wire deeply into the wet paper; the jacket on the top couch roll imprinted a different figure on the upper surface and under certain conditions, well known to all superintendents, crush resulted. Gum gathered by the guard-board was released and pressed firmly into the wire, holes from slivers and

*Read at the Spring Convention of the American Pulp and Paper Mill Superintendents' Association, Waldorf-Astoria, New York, June 3-5, 1921.

bursting of bubbles appeared in the sheet, a bad deckel edge caused pick-ups, the volume of water that was permitted to be carried for forming the sheet was often limited due to fears of a flood and consequent damage and bursting jackets frequently ruined wires. The suction roll eliminated all these mechanical difficulties and, in most cases, delivers the paper to the felt with less moisture.

The old fashioned first press was an excellent example of violating laws. The felt was ordinarily run over a flat box to remove some moisture and to get the paper to adhere properly to the felt. A roll was provided to raise the felt above the "bite" of the press rolls and out of the pond of water that was released by pressure and carried into the "bite." The paper maker was trying to dry his paper and squeeze out additional water by running it into a pond of dirty water. After accomplishing this, he found his paper adhering to the top roll after passing the bite and pulled it from the roll to pass it to the next press. If a slime spot, a bad edge or other cause weakened the paper, a first press break resulted.

Following out the idea of conforming to natural and mechanical laws governing, the bottom roll of the first press was made a suction roll. As the felt and paper approaches the bite, a vacuum removes the water and air from the felt, thus preventing crush and blows, vacuum removes instantly the water squeezed out by the top press, giving a dry bite instead of a pond of water, the paper is held on to the felt after passing the first press, eliminating most of the usual first press breaks. The paper ordinarily is lifted off the felt and carried over a small separating roll in its passage to the second press.

Tests proved that many grades of paper leaving a suction press were dry enough to pass to the dryers.

Again following natural laws, it was obvious that if a top felt to be used as carrying apron for the paper is passed around another suction roll having an inverted suction box and located beyond the suction press roll and the bottom felt still carrying the paper is brought in contact with this top felt at this suction roll, the inverted suction roll will, by vacuum, surely pull the paper off the bottom felt and cause it to adhere to the top felt by which it is conveyed to the dryers or to a roll located near the dryers, which roll will remove the paper from the felt. As the paper is blown by a jet of air or steam from the suction couch to the first felt, the machine is made automatic up to the dryers. The first installation of this type was installed by the Wausau Sulphate Fibre Company on its third machine, when purchased. This is the machine which first operated at 1,000 feet per minute, and has been the subject of considerable discussion at conventions and in the press.

Operation Simplified by Suction Rolls

It is obvious that the operation of a paper machine is simplified by the use of suction rolls, that various mechanical difficulties that have always bothered the operator and held down production, have been removed and that, to a great extent, craftsmanship in the manipulation of the machine has been eliminated, that purely mechanical means have been substituted for the machine tenders' skill. Such substitution obviously must simplify paper making and help production.

Previous to the installaton of suction couch rolls and press rolls, paper carried unequal amounts of water on to the dryers and spots and wet streaks prevailed. The practical result being that in order to dry out the streaks and spots, the body of the sheet was overdried and a higher steam pressure was needed at the dryers. The uniformity with which a sheet of paper leaves the suction couch and suction press rolls has resulted in a lowering of steam pressure and a more uniformly dried sheet regardless of whether the sheet averaged to carry less moisture to the dryers or not. In most cases, less moisture is delivered on to the dryers and a saving of steam results, which will be referred to later under the subject of "Power Required."

To quote a phrase familiar in patent descriptions, "Having thus described——" the mechanical functions of suction rolls as applied for different purposes and at different locations on the paper machine, it may be well to offer a proof that expected results have been secured.

It is unfortunate that a general statement may not be made covering all installations of different classes of suction rolls. You superintendents know that no two stocks work alike and know that a given pulp treated in different manners works differently over the machine. Illustration: a cook of sulphite pulp if beaten as for grease-proof, is difficult to run through ordinary couch rolls and yet with suction rolls this close stock shows the advantages of suction rolls perhaps in a more marked degree than any other. Under the action of vacuum, it gives up its water freely and it is not uncommon to find the paper leaving the suction couch roll 23 to 25 per cent dry. If another portion of this same cook of sulphite pulp be thrown into the beaters and only mixed and with little or no jordoning, the paper formed from it has an open formation and it does not give up the water freely under the action of vacuum. We have known cases where it left the suction couch roll only 11 or 12 per cent dry, which is not as dry as the old couch rolls would deliver the same furnish. As a result, without a suction press roll at the first press, the first felts were apt to fill up. Another portion of this same cook of pulp if beaten as for sulphite bonds, gives up its water freely, leaving the suction couch around 19 to 21 per cent dry.

Book papers made from new pulp act differently from those made largely from old papers. The average is perhaps about 20 per cent dry leaving the couch roll, for most book papers. Newspaper runs from 13 to 18½ per cent dry leaving the suction couch roll, depending upon conditions.

Kraft

At Mosinee on 25 per cent paper it was learned at 380 feet per minute on machine No. 1 having suction couch, suction press and second and third presses, that the paper left the suction couch roll about 11½ per cent dry, the suction press 32½ to 34¼ per cent dry, depending upon condition of felts, the second press about 35¼ per cent, while a 20 per cent sheet at 1,000 feet per minute on No. 3 machine left the suction press roll 32 per cent dry. It is obvious that with this grade of paper run over suction press rolls in the manner operated at Mosinee, no additional presses after the suction press are necessary or desirable, and that the power for operating them and the clothing and time required may all be saved, as any slight additional saving in moisture may better be cared for at the dryers.

It has also been learned that the character of felts used has a great influence on the operation of suction rolls. Some felts hold the water like a cotton rag; other felts give up water freely and seem alive. The latter is naturally the best felt to use.

News print paper has not yet been tried over a machine having a single suction press roll with a top felt like the Mosinee machine. Arrangements are being made for such tests. If it develops that the character of news print is such that it may be run in the same manner, it is obvious that a marked change in news print machine construction will result.

But to return to proofs of suction roll advantages. There are over 700 Millspaugh suction rolls of all classes, in use in the United States and Canada and about 100 in other countries. Most of the important book mills of the United States have all their machines equipped with suction couch rolls. The reason for book mills having so generally adopted the suction roll, perhaps lies in the fact that we early started in such mills. It was found that the paper thus made was more alike on the two sides, that it had a better retention of filler, that the sheet was better closed, took better laid and water marks and as it was not strained at the couch rolls, it took offset, multi-color printing and map printing

in better manner. One of the early and notable examples of book paper installation was for the *Ladies Home Journal* sheet—perhaps one of the most particular jobs in the country. An improvement in the printing of half-tone cuts on the two sides immediately followed.

Another reason for the general use of suction rolls for book papers has been the demand on the part of the jobber and printer for suction roll paper.

Fortunately, with the improved qualities mentioned by elimination of breaks at the couch and the better conditioning of the sheet, more paper was made at the same speed and in most cases the speed has been increased, the result being reflected in profits.

At one mill making heavy papers similar to the Library Bureau, due to elimination of crush and other disadvantages, the output of the machine was about doubled.

Fine writings, bonds, ledgers, "weddings," etc., have been found more uniform in appearance, better closed and the same advantage in water-marking observed.

It is to be noted that the clear water marks result from the fact that the couch roll does not press out the dandy roll mark, and while the water mark is left clear and distinct, it has a soft appearance, as distinguished from a mechanical imprint seen on papers marked after leaving the wire. With improved quality has come increased production on these grades. It is well known to the trade that a large percentage of the Wrapping paper and Kraft mills are using suction couch rolls, and many of them, suction press rolls.

Great Advantage on News

There is no branch of the industry in which suction rolls should prove of as great advantage as on news and no branch has been slower to adopt them. The paper is tender while moist, the speed is high, and obviously, it is desirable to eliminate mechanical troubles. We believe that it will be found that when news machines are generally equipped, that the percentage of sulphite may safely be cut down.

The first important suction roll installation on a news machine was at the Cliff Paper Company, Niagara Falls, where they first used a suction couch roll to advantage and the first suction press roll was installed there. The success of this suction couch and press roll was marked, indeed; not only was the quality improved, the production increased at the same speed, but much greater speeds were secured. The life of the wires, while somewhat longer, was immaterial compared with the saving of felts. The first felts formerly ran a week and after the suction press roll was properly smoothed up in action, records were secured of forty-seven and forty-eight days. Second felts showed twice the production. There were but two presses and but sixteen 36 inch dryers on this machine. It was, therefore, easy to observe the actual results. Notwithstanding the increased speed of the machine, the pressure at the dryers was reduced due to the uniformity of the distribution of the moisture in the sheet as it reached them and the splices in the finished rolls were practically cut out.

It is fortunate for the industry and for us that this first installation on news print was made in a mill having a progressive and unusually well informed superintendent who gave his personal attention to the details of operation and had carefully recorded actual data covering the operation of this and the other machines, not similarly equipped, over a long period of time. It is a pleasure indeed to acknowledge the value of the assistance given us by our friend, M. J. Argy and of the young men then under him who are now found as superintendents and boss machine tenders all over the country.

Roofing Papers

The quality of roofing papers has been generally improved by the elimination of crush and the sheet has been left in a better condition for saturating, carrying a higher percentage of tar. We are not informed whether greater pressure is carried at the suction press roll but do know that the paper goes on to the dryers with much less moisture, as a consequence of which the production of the machine has been increased to a point not believed by those operating in the old way. The finest roofing papers are made over Fourdrinier machines equipped with suction couch and press rolls, as a good formation of any weight is better secured and such a sheet seems able to take up more tar than one made over a cylinder machine.

Machines making straw papers are generally equipped with suction press rolls. Like roofing papers, the best straw papers are now made over suction rolls and much greater tonnage for a given width machine and a given number of dryers is secured. The most modern straw mill now being constructed will have a machine in which suction rolls play a very prominent part.

By personal interviews, written reports from mills and more particularly from the reports of our erecting engineers, we have arrived at the conclusion that, taking all grades into consideration, it is safe to state that the average increased production of paper resulting directly from suction roll installation, on the machine so equipped averages not less than 20 per cent.

With the permission of J. & J. Rogers Company, I wish to call attention particularly to their installation, as the increased production is admittedly 35 to 40 per cent. The machine was 136 inch, in every way modern, having three presses and a large number of dryers. Their trade demanded a wide range of weights and grades. There was one weight made upon which their record tonnage was secured. On this weight they were not much troubled with couch roll; at the speed they could run, it passed the presses safely and loaded the dryers to about their maximum evaporative capacity. A heavier sheet crushed at the couch, gave trouble at the presses and less net tonnage was delivered to the dryers. A light sheet passed the couch rolls, except for the pick-ups, but at the higher speeds broke at the presses. The dryers were not half loaded, the tonnage of good paper consequently was reduced. The suction couch roll eliminated all crush at the couch, the suction press roll permitted any weight sheet to pass through without trouble sufficiently dry that the second and third presses gave no trouble, consequently the dryers were loaded at all times nearly to their maximum evaporative capacity. It is to be noted that the first week the suction press roll ran, the mill's record was broken by many tons, even on the sheet previously holding the record.

Power

No question is so often asked by the superintendent as, "How much power does a suction roll take?" There is no statement made by a superintendent more often, than "suction rolls are all right but the pumps take a lot of power." Had this paper been prepared for the Technical Association, the power question would have been entered into more in detail, but as the superintendents are responsible for production at low cost, it was thought best to limit, at least for the present, power discussion to its essentials.

As a large volume of air needs be handled through the paper to successfully operate machines equipped with suction rolls, it follows that considerable power must be used for driving the pump. It is only fair to the makers of the rotary pumps in general use on our rolls to state that the cycloidal type of pumps by test on the block and in the paper mill show less consumption of power per 100 cubic feet of air displaced at a given vacuum than any other type of pump. For this reason, we have urged and even insisted upon its use. The mechanical efficiency of these pumps runs from 78 to 85 per cent, depending upon the size and vacuum and general conditions. This is a remarkably high efficiency for low pressure pumping machinery. It compares with not over 15 or 20 per cent for the best of triplex or other recipro-

cating pumps at low pressures. The pump is capable of being seamled and works under a wider range of conditions, particularly where large volumes of water are handled, than other types. It is true that if the question of actual power to rotate the pump were considered, that a suction roll installation would take more power, but this is not the case. The superintendent is interested in ultimate cost per ton of production and it is the coal pile he is interested in rather than pump power. The truth is that by reducing the amount of water to be evaporated from the paper and through having the water evenly distributed in the sheet, when it goes to the dryers, that the back pressure in the dryers is reduced, thus increasing the mean effective pressure in the engine cylinder driving the machinery and engine, therefore, delivers more brake horse-power on to the shaft with a given initial steam pressure received from the boiler. It is a remarkable fact that in the hundreds of installations made on paper machines driven by steam engines, that were supposedly loaded to the limit, in only one or two cases has it been necessary to change the engine driving the equipment, or to increase the boiler pressure, notwithstanding in nearly every case an increased speed of the paper machine has been secured. In a few words, this answers the question of power required.

Dryers used steam, whether live or exhaust, in a fairly efficient manner in evaporating water from the paper. Steam engines, disregarding value of exhaust, are very inefficient when used to develop the actual power needed to drive paper machines and pumps.

American paper mill practice consider a steam engine simply as a reducing valve between the boiler and dryers, its economy seldom being questioned, the losses of condensation in the engine being overlooked. These condensations represent important losses. English practice is to use the most efficient non-condensing engine possible to purchase, thus cutting down the losses of heat in the engine prior to exhausting the steam to the dryers. American superintendents will do well to give attention to this feature.

Dryers are closed tanks and at fifteen pounds gauge pressure, hold approximately twice the volume of steam and twice the heat units as at atmosphere (dryers are three times as efficient as steam engines in utilization of heat units), every pound of pressure reduced in the dryers represents a saving in the necessary waste between coal pile and dryers. To save one heat unit of effective evaporation at the dryers, leaves approximately 4¼ heat units in the coal pile.

A Sales engineer knowing his business well enough to helpfully discuss the power or steam problem, sometimes lacks the tact or courage to meet the indifference, to use no stronger word, of the occasional superintendent or owner who dodges behind, "I'm from Missouri" meaning as used, "don't show me."

The same facts were known years ago that are known today regarding suction rolls and their general bearing on an individual problem of paper-making. The recent spectacular performance of paper machines thus equipped, the production of light weight Kraft at 1,000 feet a minute, and the wonderful records made on the new machine at Laurentide making news print have apparently brought more people to a consideration of the problems. The small mill where the owner is in direct contact with his operating conditions and discusses his problems with the superintendent, offers the manufacturer of special equipment the best opportunities for carefully presenting his problem.

The Machine of the Future

Your President asked me to indulge in prophecy as to the machine of the future, and I half consented. In view of the remarks just made, I approach the question of offering prophecy to a lot of hard-headed superintendents with some timidity. I think I can say positively that the steam engineer will give much ground in the near future to the engineer thoroughly understanding the properties of heated air and its application to paper-making. This is no new thought to me. I would not be surprised, on many grades of paper, to see the heavy cast iron dryers heated by steam entirely eliminated, nor on many grades would I be surprised to see the present type of cylinder and Fourdrinier machine dispensed with. It is quite practical to form a sheet of paper on a machine requiring no more than six or eight feet of the length of the machine room and to do equally as effective pressing as at present in another six feet, regardless of the type of dryer used. I do not believe that there is any reason for thinking that a speed of 2,000 or 3,000 feet per minute for certain grades of paper is more difficult than 900 to 1,000 feet, as on the present type of machine. It is perhaps needless to say that suction rolls figure more prominently in this machine or prophecy. With changes now being adopted at the printing press, I would not be much surprised to see small machines capable of producing ten or fifteen tons of paper per day, installed by publishers or by companies operating with the publishers in many of the smaller cities conserving forest and transportation facilities. This prophecy is largely predicted on tariff legislation.

HUMAN ENGINEERING IN PAPER MAKING*

By Robert B. Wolf, of the R. B. Wolf Co., New York

Mr. Wolf used as a basis for his talk his introduction to the course put out by the Joint Executive Committee of the Vocational Education Committee of the Pulp and Paper Industry.

The New Human Note

He showed how the new human note was permeating engineering and technical science and, as an illustration of this, read the preamble to the Constitution of the Federated American Engineering Societies which is an over-arching organization including all the major engineering societies in the Unted States. The Preamble is as follows:

"Engineering is the science of controlling the forces and of utilizing the materials of nature for the benefit of man, and the art of organizing and of directing human activities in connection therewith.

"As service to others is the expression of the highest motive to which men respond and as duty to contribute to the public welfare demands the best efforts man can put forth, NOW, THEREFORE, the engineering and allied technical societies of the United States of America, through the formation of the Federated American Engineering Societies, realize a long cherished ideal,—a comprehensive organization dedicated to the service of the community, state and nation."

He illustrated man's use of time by showing how the Superintendent's Association was an organization for exchanging ideas; in other words, exchanging records of past performances, a faculty which is possessed by no other class of life on the planet except the human class.

He illustrated by stories from practical experiences how when men are furnished with records which measure their accomplishments, they are invariably attracted toward their work, just as the superintendent or manager is when he has his cost sheets before him, which show whether he is improving in quantity or economy of output.

He illustrated how, in many cases, men who had been working more or less destructively and were indifferent workmen worked

*Read at the Spring Convention of the American Pulp and Paper Mill Superintendents Association, Waldorf-Astoria, New York, June 3-5, 1921.

in a constructive way and became interested in their work, simply because they had some knowledge of the results of their actions.

New Engineering Conception

The introduction to the Vocational Education Course, which outlines this new engineering conception of human life, is as follows:

"Being familiar with the past accomplishments of your own trade or profession is what is meant by having a vocational education. Not many of us realize, however, that all education is based upon a faculty which is possessed by man alone, namely, the faculty of storing up past events for the benefit of future generations. The animal has not this power and, therefore, each succeeding generation of the animal begins when the previous generation began, whereas each succeeding generation of humanity begins approximately where the preceding one left off. The animal is conscious only of the present; but man, through this faculty of recording past events, is able, by studying these records, to work out the natural laws whose operation causes the recorded events to happen.

"It is a knowledge of these laws which gives man the power to control Nature's forces. For instance, the knowledge of the chemical laws of burning fuel; the physical laws of evaporation of water; and the mechanical laws of pulleys, levers, etc., make it possible to release the stored-up power of the sun by means of the steam engine. This sun power in coal, which, as is well known, is of vegetable origin, could not be released for useful work by the animal, for the animal has not the human power of storing up events in time and, therefore, the only way it can release the sun power, which it is the function of the vegetable to store up, is by consuming it and making part of it over into his own body, giving the rest out in its movement in space. Occupation of and movement in space is the essential characteristic of the animal. It is compelled to competition in space and as no two physical bodies can occupy the same space at the same time, a 'survival of the fittest' is bound to result. This kind of competition, of course, is by nature 'brutal' and destructive. The animal is a brute, however, so there is nothing wrong in it for the animal for it is fulfilling its destiny. What is wrong is the application of these 'survival of the fittest' in-space-animal types of competition to man.

"The great world war was the logical outcome of applying animal standards to humanity. Business for profit is space competition, i. e., it is a desire to accumulate things. Sooner or later our accumulations are going to interfere with the accumulations of others and a fight will result.

"As indicated in the beginning, however, our educational system enables us to be conscious of the past and, therefore, consciously to create our own future. Human beings live in the past and future as well as in the present, for knowledge of the past, comprehensively presented, enables us to prophesy what will happen in the future, if we create the necessary conditions for bringing about the desired results. There is the process which was carried out in bringing the steam engine to its present state of perfection. It was the accumulated records of each generation which enables the next one to obtain knowledge which made greater efficiency possible.

"Unfortunately, however, we have so organized our factories, through the introduction of repetitive work ideas, that the workman no longer is conscious of the flow of time, except as he reacts to it through the mere physical use of his muscles. We have made machines of our workers by taking away from them the opportunity to think and to plan. The result is that we have aroused the animal instinct of self preservation and released destructive forces which, if not controlled, will eventually wreck out civilization.

"Mr. Herbert Hoover has expressed this thought as follows:

"'The solution of the industrial problem is not solely the prevention of conflict and its losses by finding methods of just determination of wages and hours. If we are to secure increased production and increased standards of living, we must awaken the workman's interest in creation, in craftsmanship, and in the contribution of his intelligence to management.'

"Interpreting this sentence from the point of view of man as intelligently controlling Nature's forces in space and time, we can see how necessary it is for the workman to be supplied first with all possible information about the natural laws governing the raw materials he is using. These laws are available in such sciences as chemistry, physics, and mechanics, and when we study books on any of these subjects, we find them to be simply records of experiments made in times past, put together in such a manner as to make the results of these experiences quickly available for present use.

"Modern industry has been built up because the men who created our great factories had a knowledge of these sciences and, what is more important, they had constant records of their own accomplishments. The study of these records makes possible the invention of newer and better means of production. The effect of the changes, of course, are again recorded and the improvements noted. These records of progress enable those directing the affairs of the organization to become conscious of their own accomplishments and they serve as a stimulant to further improvement.

"We are soon to obtain a different concept of competition and to see human competition as competition in time. Competition in things is destructive. Competition in time, however, is competition of a vastly different order, for the recording of past events stimulates competition with the past accomplishments of ourselves, as well as competition with the past accomplishments of others. (This classification of the vegetable, animal and human classes of life, originated with the eminent Polish Engineer, Count Alfred Korzybski.)

"This is the secret of the baseball batting average. The batter does not compete in the present, otherwise the bat would become a club. He competes with the past of other batters, as well as with his own past performances. The record simply enables him to become conscious of what the past has been.

"Man is by the basic law of his own nature compelled to work for posterity and he must rebel against any force which tends to keep him in ignorance or which works against a true evaluation of past events. Our progress is from the past, through the present, into the future, and service to future humanity must become our main concern.

"This course in papermaking is nothing more or less than a record of what has happened in the past in the paper industry, to the end that when these recorded truths are thoroughly comprehended, there will be much less disagreement about the best production methods.

"The power to create the best method depends upon our knowledge and the purpose of the vocational education textbooks is to free the oncoming generation of papermakers from the necessity of duplicating the mistakes of others. A great deal of time and study has been given to the textbooks by men of long experience in the industry, and no pains have been spared to present their past experience in a well organized and thoroughly comprehensive manner."

Henry Ford, he of automobile fame, was a visitor in Kalamazoo last week. Rumor has it that he is scouting about the country in search of a boxboard mill to supply his concern with needed boxes for the shipment of parts. Attempts to interview him indicate that the one-time famed Czar of all the Russias would be far more accessible and approachable were he still in the land of the living and vested with full power. Mr. Ford is guarded and talks are tabooed.

CARE OF WOOD ROOM EQUIPMENT*

By R. R. Fox

This is a most interesting subject that I have been asked to talk about, and one that I am glad to talk about and discuss, with a gathering of thoroughly practical men.

Superintendents' Responsibility

The superintendents of most mills are the men responsible for the equipment now in use in the wood room of their plants. They are the men who first see the necessity for improvements; they are the men that are looked to by the company for both quantity and quality of production, and for production at the lowest possible cost. The company looks to them for results, and if they are not allowed to make the necessary improvements in their equipment and employ the kind of men they want, how can they be expected to produce the best results?

There are many superintendents of big mills and plants who say to their directors: "Let me put in the equipment I want and hire the men I want, and I will be able to deliver the goods." This, as a rule, is what the heads of most companies want of their superintendents.

Wages

The high wages being paid to labor, and the slowing down of this same labor, make it absolutely necessary for manufacturers in this country today to increase their production per man by installing more efficient machinery and up-to-date equipment, or by speeding up their present equipment, or they will not be able to operate successfully in the future.

Speeding Up Machinery

High speed machinery in every manufacturing industry is what the demand is for today. There are opportunities for improvements and for speeding up the machinery in the existing wood room equipments of most of the pulp and paper mills without going to a very great expense. A few little changes could be suggested that would avoid delays and shut-downs in your wood cutting equipment.

Conveying Equipment

While visiting some of the groundwood plants recently I noticed in some of them that the conveyors that carry the wood to the saw tables were frequently shut down. The main cause for most of these delays was from the small pieces of wood rolling and changing their position just as the saw first hit the wood. Some of these delays could be avoided if these small and crooked pieces of wood could be held firmly or solidly against the knees on dogs of the conveyer when they meet the saw.

Hand Saw Experience

You have all had experience in cutting off a board or piece of wood with a handsaw. You know how you usually try to find a solid place on which to rest this board or piece of wood. When you find a solid place you hold the board down firmly either with your hand or with your foot, so that it will be firm and rigid. In this way, the board can be sawed quickly and much more satisfactorily than if it were allowed to wobble around. This same principle would apply to the 4-in. pieces of pulpwood on the conveyers that carry this wood to your cut off saw.

These sticks of wood rest lightly against the knees of the conveyer that carries them to the saw, and when the saw first hits the stick it usually changes its position. It is just at this time when accidents occur, if they do occur. The turning of the stick will sometimes pinch and bind the saw and not infrequently stop the machinery. This creates delays that are expensive, and can, in most cases, be avoided through the installation of a very simple device.

In some of the small shingle mills in the northwest, they cut the shingle bolts by about the same method that is used in cutting up wood in pulp mills. The only difference is that in the shingle mills the blocks or pieces are cut into 16 in. lengths. Just over the conveyer in some of these mills they have a simple frame constructed and suspended from this that will have a narrow hard wood board or a long piece of tempered steel that rides over these blocks in such a manner that it forces them to rest solidly against the knees of the conveyer just before the blocks reach the saw. With this simple method, the blocks or pieces of wood cannot be easily moved from their position until after they pass the saw and are released from the pressure of these springs. These springs of board or steel are placed high enough above the conveyer so that they have the same effect on a large stick of wood that they do on a small one. In the shingle mills they do not have very small and crooked pieces of wood which are the pieces that seem to cause most of the trouble in pulp mills.

May Speed Up Conveyor Machinery

By reason of the use of this simple device, it should also be possible to speed up your conveying machinery, if a greater production from this department is required. Many saws have been badly pinched; some cracked and some broken as a result of pieces of wood becoming jammed between the knees of the conveyer or the side of the conveyer and the saw. These accidents could be reduced to a minimum by the use of this simple device that I have tried to explain by removing some of the causes for accidents to your saws.

Improvements in Saws

I will explain some of the late improvements in saws. The main saw or saws in a mill are like the heart in the human body; while the heart beats regular and true, the whole human system is usually in perfect working condition; while a saw is running true and cutting freely, the whole machinery equipment will usually be found to be working perfectly. The saws and knives in a wood room of a pulp mill are a more important item of your equipment than is generally realized—you can have the best constructed building, the most modern and expensive conveying machinery and motive power in the world, but you can only cut up as many cords of wood in a day as your saws will cut.

Growing Demand Anticipated

Some of the progressive saw manufacturers have anticipated the growing demands for high speed machinery as the price of labor has advanced during the past several years, and they have met these demands through making changes in the styles and improvements in the quality of saws.

There are saws being produced today that are far superior to the old-style solid tooth cut off saws for cutting up pulpwood. These improved saws *will stay sharp very much longer*, make a much *smoother cut*, hold their *tension longer*, will *not crack* in the gullets and take much *less power* than the old-style saw. They are what we call Inserted Tooth Cut Off saws. Some of the manufacturers have been going through a period of development with these saws for the past eight or ten years, and at very great expense to themselves. Today there are several styles of these saws that have reached a high state of perfection. It was in the shingle industry of the Pacific Coast that these saws first came into use. Shingles are made in the big shingle mills from very large cedar logs that are hauled out of the woods through gravel for a long distance. During this operation a great amount

*Read at the Spring Convention of the American Pulp and Paper Mill Superintendents Association, Waldorf-Astoria, June 3-5, 1921.

of gravel becomes imbedded into the bark of these logs. After they reach the mill they are hauled into the mills in lengths from 16 to 40 in. long and shingle blocks of the desired length are cut from the log direct by these very large saws. In some of the mills they have a saw on either side of the log carriage for use in cutting into the log from both sides, and these saws are so accurately lined up and run so very true that the cut from both sides of the log will meet in the center on exactly the same lines.

There are three very essential features in a saw in these big shingle mills:

1st: That they retain the original diameter of the saw.

2nd: That they always run straight and true.

3rd: That they always make a perfectly smooth cut.

It was not possible to cut shingle bolts successfully from these big logs with the old-fashioned solid tooth cut off saws, for, as these saws would become dulled very quickly on account of so much gravel in the bark, that they were required to be taken off to be sharpened too frequently. The time lost in changing saws so often was a big item, and by this frequent sharpening and gumming they were rapidly reduced in diameter, and this had the effect of changing the tension in the saw. This would cause them to wobble or run snaky on the rim, and to remedy this condition they had to be sent to some shop to be rehammered, for these very large saws cannot well be hammered in the mills.

Today you cannot find a solid tooth saw in operation in any of the big shingle mills on the Pacific Coast, for, with these inserted tooth saws, all the old troubles that were experienced with solid tooth saws have been overcome. The manufacturers who first started to produce these saws experienced many difficulties with the first ones that were put into use, but by changes and improvements were made so that today the manufacturers are in a position to guarantee these saws to give satisfaction, if they are properly taken care of. You will be interested to know about the sizes of the saws used in the big shingle mills. Most of the mills use 7 ft. or 84 in. saws. There are some 96 in. saws and a few 108 in. or 9 ft. saws in use. Some saws! don't you think?

Automatic Sharpener

To keep these saws in perfect condition they should be sharpened on a modern automatic sharpener that has been designed especially for them. These sharpeners will keep the saws absolutely round and in balance so that each and every tooth will do the same amount of cutting. They will keep the bevel on the face and on the top of the teeth at the proper angle at all times. When saws are kept in perfect condition they save a lot of power, save wear and tear on other machinery and avoid many delays in operations, that tends to increase production and lower your labor production cost.

Manufacturing Solid Tooth Saws

Solid tooth cut off saws are hardened and tempered so that the teeth can be spring set without breaking. This means a degree of hardness that will allow the teeth to be filled easily, and at this degree of hardness the teeth will not hold their cutting edge for any great length of time. By frequent sharpening, these saws are reduced in diameter very rapidly, and as a result of this the tension is taken out of the saws on the rim and they begin to run snaky or wobbly, which causes them to cut rough, take a lot of power and sometimes become cracked in the gullets.

All these difficulties and many others are avoided in the inserted tooth cut off saws. These inserted teeth, by reason of the fact that they do not have to be spring set, are made about 300 deg. harder than the ordinary solid tooth cut off saw. On account of being harder, they will hold their cutting edge very much longer.

No two manufacturers make the same style and pattern of cut off saw teeth. It will have to be left to the good judgment of the superintendents to figure out which style is the best for their work and which style can be operated the most economically.

Other things to be considered are: The amount of time it takes to remove the worn out teeth from the plates and to insert a new set of teeth in the plates. Another feature to take into consideration is the amount of side set in the teeth. There is supposed to be a sufficient amount of side set in the new teeth to give them the proper clearance on the side until they are worn out.

The saw plates in these inserted tooth saws are also much harder than solid saws, and by reason of this fact will hold their tension much longer, and, when hammered correctly for the speed they are to run, they can be depended upon to run perfectly for an almost indefinite period.

Art In Saw Making

The real art in saw making is in the heat treating of the steel. All of the many other operations in making saws and saw teeth are largely mechanical. In modern plants they are not tempered by guess any longer. This hardening and tempering process is a highly scientific operation. This is made possible through the modern pyrometers for testing the heat, and this makes it possible to produce any quantity of saws or saw teeth at an absolute, uniform degree of hardness for an indefinite time. It, of course, is absolutely necessary to have steel of the proper alloy to start with. A few of the large manufacturers long ago established their own plants and started making their own steel. They installed the most modern Crucible and Electric Furnaces and equipment that could be obtained. As a result, these plants are able to produce a very superior quality of steel for special kinds of saws and knives, and in this way are able to maintain a uniform quality of products which they could not always do in the old days when depending upon outside plants for their source of supply.

Chipper Knives

There have been no very wonderful changes made in the style or quality of chipper knives for many years past. The modern method of inserting chipper knives into the discs in which they are operated by placing them on an angle that gives them a shear cut is a very decided improvement. This improvement, like many other improvements in wood room equipment, I understand, was suggested by a paper mill superintendent.

If chipper knives are kept sharp and ground on the correct bevel, they should hold their cutting edge longer and require less power to operate than when ground on a single straight bevel.

While no great improvements have been made in chipper knives to enable them to run longer than the ordinary knives, there have been improvements made in knives for other kinds of work that allow them to hold their cutting edge much longer than the old style knives.

By maintaining a shorter or double bevel on your chipper knives, they would hold their cutting edge longer than when ground on a straight or concave bevel, as they are being ground in some plants today.

Solid steel chipper knives give better satisfaction than knives made from laid stock. With laid steel knives the great trouble is with the steel separating from the soft back. This is caused by the knives pounding on the wood. With solid steel knives there is no weld or joint to become separated. Brazed high speed steel chipper knives are not a success. The brazing will not hold as it will on the planing machine knives, for the reason that the brazing cannot be done well enough to hold the high speed steel and soft steel back together long enough for the two to wear out together. Because of the operation of alloys in the high speed steel and soft steel, they do not permit of welding. Experiments are being made along this line, but nothing very practical has been arrived at to date.

Hardening and Tempering

In the case of solid steel chipper knives I might explain that the hardening and tempering is not done in the usual manner of quenching the whole knife in the bath at the same time, but is accomplished by hardening the cutting portion of the knife in brine. Before the original heat in the knife has cooled, the whole knife is quenched in oil so as to harden the backs slightly and the usual tempering operation follows after this double-hardening process has taken place.

Ground Slots

The knife manufacturers would appreciate co-operation of pulp and paper mill superintendents in the matter of specifying round-end oblong slots in knives instead of the square-end slots which is a bad thing, on account of the danger of cracks radiating from square corners in the hardening operation, which danger does not exist where round-end slots are used. As we understand it, the square or oblong slots have come into main use simply because it is easier for a blacksmith to make bolts with square ends rather than round ends, as would be necessary in the case of round-end loop slots in the knives.

Paper Knives

For paper-cutting knives a quality of steel has been developed for the cutting edge in these knives that is a great improvement over the steel formerly used. One of the largest and usually considered highest grade paper cutting machine manufacturers equip their machines with the best quality of paper cutting knife that can be produced. They do this as a matter of safety and insurance that the first impression obtained by the combination of the best machine and best knives will satisfy the purchaser that he has used good judgment and invested his money wisely.

Dye Wood Knives

In the dye wood industry of South America, we have been experimenting with a new quantity of steel that is giving wonderful results. The woods from which dyes are produced are very hard. They are known as Quabacho and Fostick woods, and the new knives we have been supplying to this industry are giving excellent results. We believe that chipper knives made from the Dye Wood Steel will give equally good results in the pulp industry.

Dye wood knives, by the way, are made and used in a somewhat different manner. Half of the set are fluted knives and the other half, the usual straight knife. They are set alternately; so, you see, the fluted knife makes the fluted cut, and the knife following, being a straight knife, cuts off the flutes. This is necessary on account of the hardness of the wood, and the advisability of cutting cross grain. This method of cutting this wood is also a great saving in power.

Inspection System

In a modern plant saws and knives are inspected at every operation from the time the steel is started at the mill to the blast or finishing operation. These inspectors are independent of all factory foremen and superintendents and are responsible to the general manager and president exclusively. Their instructions are to not deviate from the set rules and standards that are established and always maintained.

Armor Plate

During the war, some of the saw manufacturers were called upon by the Government to develop a superior quality of this armor plate steel for armored motor trucks and armored machine guns. The efforts of the saw manufacturers in developing a superior quality of armor plate were met with wonderful success. The research and the experimental departments that developed this wonderful quality of thin armor plate and that have developed these inserted tooth cut off saws, and the steel used in the knives for the dye wood industry of South America are being maintained for the benefit of our customers to help them meet the demands for greater efficiency in their saw and knife equipment.

It is not a difficult matter to convince a practical superintendent of the advantages in using the highest quality of saws and knives than can be produced, but we do have difficulty sometimes in our efforts to convince purchasing agents that there is any difference in the quality of the different makes of saws and knives. The purchasing agents usually say that all saws look alike to them, that all they are after is a low price and that price alone will get the order. Some superintendents will send a requisition to their purchasing department for a certain quantity and quality of material. These purchasing agents will send out inquiries for quotation, and when these quotations come in they go over the figures and usually place the order with the firm that makes the lowest price. There are manufacturers in all lines of business that cater strictly to what we call purchasing agents' business. As a rule, these concerns do not maintain a sales organization, for they want to eliminate this expense to enable them to make a lower price than the large manufacturers who do maintain a sales organization for the purpose of calling on the trade to find out from the practical men in the plants what they require in the way of quality to meet the demands in their plant. Under this plan, of having purchasing agents buy all goods on a price basis, you cannot get the best quality of goods.

In your wood room department you are required to frequently replace the cutting tools, and other parts of your equipment that wear out the fastest. If your saws and knives are purchased through your purchasing agents, strictly on a price basis, you will get a lot of inferior goods, for the best goods are not sold at the lowest prices.

With an inferior quality of saws and knives, your production is cut down and your labor and overhead costs are increased, thereby.

Pacific Coast

The big development in the pulp and paper industry in the future will be in Canada and on the Pacific Coast. The supply of pulpwood is almost unlimited in Oregon, Washington, Britsh Columbia and Alaska.

I spent twenty years in Seattle and traveled about all over that territory, and am quite familiar with the location of the big bodies of spruce and hemlock timber, and with the big water power opportunities.

I have furnished information along these lines to several parties here in the East and will very willingly give the same information to any man interested in looking into this matter.

Beaver Board Pays $35,150 to Niagara Wall Board

BUFFALO, N. Y., June 4, 1921.—Nearly a year and a half ago the Niagara Wall Board Company of this city of which John B. O'Brien is President and C. C. Hullinger is Secretary and Treasurer, commenced action against the Tonowanda Board and Paper Company, a subsidiary corporation of the Beaver Companies to recover breach of contract.

The action grew out of the purchase of the Tonowanda Board and Paper Company by the Brewster interests, and the Tonowanda concern refusing to live up to existing contracts to supply fibre stock to the Niagara Wall Board Company.

After many delays and postponements for trial, the settlement of $35,150 out of court cleans up all claims and counter-claims.

The Niagara Company was represented by Evan Hollister of Locke, Babcock, Spratt & Hollister and the Beaver Board interests by Moot, Sprague, Brownell & Marcy of Buffalo; Rabinold, Schibner and Campbell of New York City, and John Lord O'Brien.

The Niagara Wall Board Company was founded by the above former officials of the Beaver Company. The Niagara Company also operates a fibre mill and finishing plant at Penn Yan, N. Y. Niagara stockholders are chiefly Buffalonians.

BEATING*

By C. C. Stewart, of the Harding Paper Co., Division American Writing Paper Co., Franklin, Ohio

I realized when I started to write this paper that I had tackled a subject which covers a mighty broad phase of the paper industry and a most important one; in fact, to my mind it is the very heart of the whole process. The machine is no doubt a most important asset, but after all it is merely a mechanical contrivance which must be adjusted according to the kind of stuff the machine tender gets from the beaters. If this stuff is not right, neither he nor anyone else can make it right.

A Process of Disintegrating

Beating is the process of disintegrating, of drawing to a length adapted for the weight and quality of paper to be made, and of making flexible by hydration, a cellulose fiber. This is accomplished by numerous types of machines, all working toward the same goal in a more or less efficient manner, especially from a power consumption standpoint.

Beating may be divided into two main classes, disintegration and circulation. Different conditions, during the process of each, will govern the result. I shall touch briefly on both of these subjects, taking disintegration first.

Disintegration depends upon:

1. The type of beater used.

2. The angle of inclination of the bed plate to the beater roll, or vice versa. The action on the stock becomes more rapid as the angle is increased.

3. The size and weight of the roll. The size governs the number of inch strokes per minute and therefore the ultimate output of the beater. The weight of the roll governs the pressure of the roll on the bed plate; therefore, the heavier the roll, the more rapid the action on the fiber.

4. The type of fly bar used. It may be either straight or corrugated. I believe the corrugated bar is best for a high grade of paper, such as bonds, ledgers, etc. Theoretically, the corrugated bar should increase beating capacity, because it presents a greater cutting area to the bed plate. Actually, I do not believe it does, because as the area of the cutting edge is increased the beating capacity is decreased.

5. The circumferential speed of the roll. A constant speed must be maintained in order to get a uniform product. The speed should be kept at a point which will not allow the stuff to form a barrier in front of the roll, thus hindering the circulation. The most efficient speed seems to average between 1600 and 2000 linear feet.

6. The grade of raw material used. This is one of the big factors in the disintegrating process. Some fibers are so short they merely need to be hydrated, for example straw and esparto. Others, such as the wood fibers, although longer, are so smooth and flat that they escape a great deal of the cutting. Cotton and linen fibers require the longest and most careful attention, for too rapid an action will cut them off clean, leaving them with too great a capillary attraction, and a minimum amount of felting qualities, which make them only fit for such papers as blotting. When beating fibers for writing paper, it is necessary to beat and draw them into fibrillae, which will give them their greatest felting and strength qualities.

Hydrating Action

Simultaneously with the disintegrating process, a hydrating action is going on, or to use a more common expression, the stock is being made "slow" or "wet." In hydrating stock, it is necessary to force the water into the hollow cells of the fiber. It is a chemical action aided by mechanical means. It can also be aided by the addition of an alkali, or by beating alternately in a vacuum and in the air. The former, however, is not practical, inasmuch as it would affect the coloring and sizing of the paper. Silicate of soda is a possible exception to this.

Circulation in Beating

I shall now take up the second phase of the subject, namely, circulation. This is one of the most interesting studies in beating and might be subdivided into consistency and propelling force.

It is impossible to increase the production of the beater by lowering the consistency of the stock which will allow the fibers to circulate at a more rapid rate. This increased circulation will let the fibers pass between the roll and the bed plate a greater number of times per hour, thus increasing beating capacity. For example, a lowering of 20 per cent in the consistency will increase beating capacity an average of 35 per cent. There are other factors to be considered in connection with this, however. Many believe that a beater loaded lightly will work free, while one loaded heavily will work slow. Tests run by the Department of Technical Control of the American Writing Paper Company tend to disprove this by means of the A. B. Green Slowness Indicator. A beater furnished at 6.55 per cent consistency, shows a reading of 450 c.c. of water, while one furnished at 5.27 per cent (a difference of 1.28 per cent less) shows a reading of 500 c.c. of water. Even with the reduced consistency, the same relative degree of slowness was obtained, indicating that the lower consistencies would give stock that was just as slow, providing the roll was handled properly. It would seem, therefore, that it would be more efficient to furnish a beater lightly and increase the output by sending the stock under the roll a greater number of times per hour. This low consistency with its corresponding increase in circulation will result in less time required for beating, so it becomes necessary to empty the beater in a shorter period of time, or else there will be danger of shortening the fibers too much.

The other subdivision of circulation, namely the propelling force of the roll, is ascertained by the product of the R. P. M., the number of bars, the area of the space between the bars. It is possible to slightly increase the circulation by merely increasing the area of space between the bars, as in a washer for instance. This is not always good practice in beating however, because it will lessen the inch strokes per minute and thereby increase beating capacity.

Interesting Time Studies

I made some interesting time studies a few months ago, on beating that you might be interested in. We have four 750 pound beaters beating stock for our No. 1 machine. These beaters have corrugated fly bars and a seventeen bar elbow bed plate. The fly bars were all in the same condition (having been put in at the same time) while the bed plates were pulled and chipped in order to have all conditions as equal as possible. Time and order of emptying was noted on forty beaters of Ledger stock, the beaters being numbered one, two, three and four. Number one beater emptied ten times in an average of eight and one-third hours. Number two beater nine times, averaging nine and one-quarter hours. Number three beater eleven times, averaging seven and three-quarter hours. Number four beater ten times, averaging eight and one-half hours. These beaters were apparently in the same condition, worked in the same manner, yet one beater could get the stock off in less time than the other three. I speak of these studies in order to show that the idea of dropping beaters in a regular order is not good paper making practice, because no two beaters will beat alike and moreover, it is difficult to even get the same beater to handle two furnishes of the same kind in the same way.

*Read at the Spring Convention of the American Pulp and Paper Mill Superintendents' Association, Waldorf-Astoria, New York, June 3-5, 1921.

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DYES USED IN PAPER MAKING*

By Kenneth W. King, of the E. I. Du Pont de Nemours Co., Chicago

The subject of "Dyestuffs and their relation to the Paper Industry" comprises many phases varying in interest and importance to the manufacturer of paper. Those of lesser importance can only be touched upon briefly in a paper of this kind. The processes of manufacture of aniline dyestuffs, while of casual interest to the consumer, have very little direct bearing on their application in the mill.

Complete details of all branches of application of dyestuffs to paper will be found in the chapter on "Coloring of Paper," to be published this fall in the fourth volume of the work now being done by the Vocational Educational Committee of the American Pulp and Paper Association. It is hoped, however, to convey in this paper information concerning the dyestuff situation as it exists in this country today, the relation of the manufacturer to the consumer, and a discussion of some of the problems that arise daily in general beater room practice.

An Important Resolution

Among the resolutions passed at the annual convention of the American Pulp and Paper Association last April, were the following:

WHEREAS this country, desiring peace, cannot escape the necessity of adequate preparation for war; and

WHEREAS the world war has demonstrated that in modern warfare chemistry will be as dominant as it is in modern industry, and

WHEREAS the synthetic dye industry is the backbone of the chemical warfare service which so conclusively demonstrated its possibilities and efficiency; now, therefore, be it

RESOLVED: That we urge upon the Congress, and individually upon our respective representatives, the favorable consideration of such legislation as will assure the continued growth, operation and control of a dominant synthetic dye industry; and be it further

RESOLVED: That we also urge adequate financial support of the chemical warfare service, both to protect the large investment of the government in that division, particularly in the Edgewood Arsenal, and to keep our army and navy abreast of modern developments in this branch of the service.

To understand the significance of these resolutions, a brief discussion of the growth of the American dyestuffs industry is necessary. In 1914 there were seven concerns in the United States, with a total capital of approximately $3,000,000 manufacturing dyestuffs. The total output of these companies was 6,619,729 pounds of coal tar colors, with a value of $3,386,212. All of these dyestuffs, however, were made from intermediates, which were supplied for the most part from Germany. During the year 1914, the importations from Germany amounted to 45,480,366 pounds of aniline dyestuffs. There is no need for me to relate the trials and tribulations to which manufacturers of colored papers were subjected between the time when the importation of German dyestuffs was stopped and when the production of the American dyestuff industry assumed proportions which were adequate to take care of the needs of the consuming industry in this country. At the present time there are over two hundred concerns manufacturing dyestuffs in this county, with a total output of over 60,000,000 pounds per year. Since the outbreak of the war this country has not only made itself independent of Germany with respect to its supply of dyestuffs, synthetic drugs, perfumes, etc., but has become an exporter of the surplus stocks of dyestuffs which are not needed for consumption in this country, and has developed a personnel of trained organic chemists whose value from a standpoint of national preparedness is unquestioned.

The production of dyestuffs suitable for the paper industry manufactured in this country is more than adequate to meet the demand. Practically every dyestuff necessary in the manufacture of paper is now produced in this country, and it is only a question of time until some of the minor specialties which certain mills are asking for and where the total consumption throughout the country during the year is very small, will be manufactured. It has been the policy of the American dyestuffs manufacturers, and justly so, to manufacture those dyestuffs for which, in volume, there was the largest demand, and gradually to work towards the specialties which would benefit only a few.

Three Groups of Paper Coloring Materials

Coloring materials used in the paper trade are divided into three groups, namely, pigments, natural organic dyes and aniline dyestuffs. Centuries ago paper was colored by the use of various pigments or extracts obtained from various sources. The first aniline dyestuffs were discovered in the year of 1856 but their production was not developed on a commercial scale so that their use could be made efficient in paper manufacture until about the year of 1890. Since that time aniline dyestuffs have displaced the greater proportion of pigments, and vegetable extracts or natural organic dyes. Certain pigments, such as ultramarine, Prussian blue, lamp black, ochres, umbers, etc., still have a limited usage in certain grades of paper, but the economical production of aniline dyestuffs has gradually caused the latter to supersede all other types of coloring.

Aniline dyestuffs are manufactured from coal tar, which is a by-product of gas manufacture. The quantity of coal tar and its percentage depend on the method of distillation of the coal, but on an average, one ton of coal will produce approximately 12,000 cubic feet of gas, 1,200 to 1,500 pounds of coke and 120 pounds of coal tar. This tar contains several different substances which are termed "crudes," the most important of which are benzene, toluene, xylene, phenol, napthalene and anthracene. You are familiar with two of the most important of these crudes, viz., phenol or carbolic acid, and napthalene which you see in every day life in the form of moth balls. From these crudes approximately 300 intermediates are made, which in turn, by means of various chemical processes, are manufactured into a thousand different dyestuffs. The manufacturing apparatus of intermediates and dyestuffs is simply a series of tanks, autoclaves and filter presses, a knowledge of which is of no importance to the paper manufacturer.

What is of major importance to the consumer is the standardization of the finished dyestuff. In order to color his paper uniformly, the beater engineer must decrease the variables with which he comes in contact. He must be assured that when he has once established a color formula for a given furnish, barrel after barrel of dyestuff will be absolutely uniform with respect to shade and strength. All dyestuffs, after being filtered and dried, are ground to a fine state of subdivision, tested for shade and strength, compared with the standard adopted by the manufacturer, and then different lots mixed together with varying amounts of the standardizing medium to give the standard shade and strength as adopted by the individual manufacturer. The standardizing medium for basic dyestuffs is dextrin, while either common salt or Glauber's salt is used for acid and direct dyestuffs.

Five Groups of Aniline Dyes

There are five groups into which aniline dyestuffs are classified, viz., basic, acid, direct or substantive, sulphur colors and vat

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colors or pigments. Basic dyestuffs should never be dissolved with acid or direct dyestuffs, but acid and direct dyestuffs can be dissolved together. Sulphur colors have very little use in the paper trade at present, due to the many disadvantages entailed in their use. Basic dyestuffs as a group are strongest tinctorially and are by far brighter than those of any other group, but are not fast to light. They have a strong affinity for sulphite and ground wood pulps, and will color any wood stocks successfully without the use of either size or alum. Acid dyestuffs are as a class, faster to light than basic dyestuffs, but weaker tinctorially. They have no direct affinity for any vegetable fibres and hence can only be used on sized papers. Acid dyestuffs are used when a very even dyeing is required, especially in light tints. Because of the fact that they have no particular affinity for vegetable fibers, acid dyestuffs are generally used for calender coloring. Direct or substantive dyestuffs as a class are faster to light than either acid or basic dyestuffs, but are much weaker tinctorially than those of the basic group. Direct dyestuffs derive their name from the fact that they have a direct affinity for vegetable fibers and for that reason are used for blotting papers and any other non-sized papers. All direct dyestuffs are affected in shade by the use of alum and allowances must be made for such changes.

The statement was made earlier in this paper that the production of dyestuffs in this country had reached a stage where all paper manufacturers could standardize their color work to a higher degree than ever before. This holds true to one hundred per cent in the manufacture of papers containing wood pulp, the only exceptions being certain high-grade rag specialties; and before this year is out, those few exceptions will be taken care of.

The First Step To Take

The first step for the superintendent or beater engineer to take is the selection of dyestuffs most suitable for his work. This selection must be based on the type of stocks he is using in his paper, the degrees of fastness properties to which his finished products will be subjected, and to the general source of supply of such dyestuffs as he may select. As far as fastness properties are concerned, the different groups, such as basic, acid and direct, have certain group properties which can be considered as a whole in this discussion.

It is a well-known fact that ground wood will discolor very rapidly when placed in the sunlight. Therefore, in all papers containing ground wood, the dyestuff selected should not be any more fast to light than the ground wood itself. Basic dyestuffs are the cheapest and most economical for use in ground wood papers because their relative fastness to light is approximately the same as the ground wood itself; they are the brightest tinctorially of any group, thus giving an increased brilliancy of shade to a stock which is fundamentally dull. With the aforementioned affinity which basic dyestuffs have for ground wood, the backwaters are left practically clear and hence one hundred per cent efficiency is obtained in color value.

Degrees of Fastness

The degree of fastness to light of sulphite pulps depends on the method of cooking and the degree of washing of the stock. A slow cooked, well washed sulphite pulp is faster to sunlight than basic dyestuffs, but this difference is so slight that unless special fastness properties are required, the increased fastness of acid or direct colors does not usually warrant the increase in cost. This is especially true when the brightness of basic dyestuffs and their retention is considered. There are certain acid dyestuffs, such as orange, nigrosine and metanil yellow, which compare very favorably in price with the basic dyestuffs, and in considering the question of economy, they can really be classed with basic dyestuffs.

Bleached wood pulps are as fast to light as the average acid or direct dyestuff, providing they are carefully washed free from all traces of chlorine. In case trouble is experienced in the mill, due to inadequate washing, dyestuffs should be selected which will be impervious to any quantity of chlorine which might be left in the pulps.

Carefully prepared rag stock is faster to light than any of the dyestuffs of the basic, acid or direct groups. The average fastness of certain acid and direct colors, however, is sufficient to meet the requirements to which the average rag papers are subjected. If the specifications of rag papers call for an absolute fastness to light, then recourse must be had to certain vat or pigment colors.

Chart of Fastness Properties

We are preparing a chart in connection with the work of the Vocational Educational Committee which gives the fastness properties of the majority of dyestuffs used in the paper industry, and the changes effected thereon by all chemicals with which these dyestuffs come in contact during the process of paper manufacture. This chart includes the reactions of the individual dyestuffs in the presence of size, alum, various fillers, weak and strong acids, weak and strong alkalies and chlorine, together with a relative grading of the fastness to light of these different colors. It is my opinion that this chart will be the most valuable piece of work accomplished through the hearty cooperation that now exists between the dyestuff manufacturers and the paper manufacturers, and it should be an immense help to the superintendents in making the selections of dyestuffs most suitable for their work.

Number of Dyestuffs Should Be Kept as Low as Possible

From the standpoint of beater room efficiency, the number of individual dyestuffs used in any one mill should be kept as low as possible. During the past few years there has been a natural tendency, due to conditions during the war, to have a stock of forty or fifty different dyestuffs or mixtures in the mill, when eight or ten individual dyestuffs would do all the work required, in a more efficient manner. With trade conditions as they are today, the carrying in stock of a large number of individual dyestuffs or mixtures entails the tying up of considerable capital, as well as causing excessive handling and storage in the mill. At the present day no question on the coloring of paper requires the attention that should now be given to the selection and standardization of a small group of individual dyestuffs obtained from a manufacturer with a constant source of supply. The dyestuff manufacturer should guarantee to the paper manufacturer dyestuffs under a single standard name absolutely uniform as to shade and strength.

Dissolving Dyestuffs

The proper method of dissolving dyestuffs is often seriously overlooked in many mills. There are certain cases, as, for example, in the use of chrysoidines and basic browns in the board mills, and in the use of auramine, where the dyestuffs may be added dry to the beater. An excellent general rule to follow, however, in all mills, is to dissolve and strain all dyestuffs added to the beater. This straining eliminates two factors that might decrease the quality of the finished sheet. The dyestuffs furnished by representative manufacturers are very finely ground and passed through a fine mesh wire before being packed, but in opening a barrel and allowing it to remain open, a small amount of dirt is liable to become mixed with the dyestuff, and you are well acquainted with the fact that it only takes a minute quantity of dirt to loom up like a mountain in the finished paper.

The proper methods for dissolving the different groups of dyestuffs are as follows: Basic dyestuffs are the least soluble of any of the groups. Water just below the boil should be placed in the dissolving tank and the dyestuff added slowly with constant stirring. The ratio of water to concentrated dyestuff should be in about the proportion of forty to one. Solutions of basic dyestuffs should never be boiled, for continued boiling depreciates their strength. Basic dyestuffs also deteriorate in strength when

left in solution over twenty-four hours. An exception to the above rule for dissolving basic dyestuffs is that auramine should never be dissolved in water over one hundred and forty degrees Fahrenheit. It is for this reason alone that recommendation is often made to add auramine to the beater in the dry state.

Acid and direct dyestuffs are much more soluble than basic dyestuffs, the ratio of water required to dyestuff being in the approximate proportion of twenty to one. Boiling does not hurt the strength of these groups, nor does it add any material advantage. For that reason a good general mill rule is not to boil any dyestuff solutions.

Additions of Dyestuffs

Opinions differ as to the proper order of addition of dyestuff, size and alum to the beater. Such a divergence of opinion is natural for water conditions have a direct bearing on this subject. With soft water, basic dyestuffs should be added before the size and alum, while if the water is comparatively hard the dyestuffs should be added either after the size and alum, or a small proportion of the alum to neutralize the hardness should be added before the color, followed by the size and the remainder of the alum. With acid dyestuffs this question depends upon the amount of excess alum used in the paper. If only enough alum is used to precipitate the size, then no difference will be ascertained whether the dyestuff is added before or after the size and alum, but if an excess of alum is used in the beater, slightly better results will be obtained by adding the dyestuff after the size and alum. Direct dyestuffs should always be added to the beater before the size and alum.

Many Problems to Be Solved

Many problems must be solved in connection with the coloring of paper before that part of paper manufacturing has reached a state of efficiency toward which we are working in all of its branches. Many questions about which there are wide differences of opinion, such as the prevention of foaming, the absorptive power of different sulphite stocks, due to differences in methods of cooking, comparative losses in backwaters, etc., can only be solved through cooperation of the superintendents and beater engineers in the mills and the technical departments of the paper mills and dyestuff manufacturers. The dyestuff committee of the American Pulp and Paper Association, through its chairman, has written to a large number of paper makers to obtain their opinions on the best practical methods for coloring paper, and it is a digest of such opinions correlated in as concrete a form as possible, which we hope will serve as a basis for the highest degree of efficiency obtainable in the coloring of paper.

DEVELOPMENT OF THE ELECTRICAL DRIVE*

By W. W. Cronkhite, of the General Electric Co., Schenectady, N. Y.

When your committee extended an invitation to the General Electric Company to present for your consideration a description of their new type sectional drive for paper machines, they welcomed the opportunity, I assure you, for no drive as important as the one that runs the paper machine can be generally used, unless the superintendent of the mill approves of it absolutely. Naturally the superintendent cannot approve something he does not understand, or a type of drive that has not been explained fully to him, and while the General Electric Company have prepared and mailed pamphlets with photographs, etc., describing their drive, they felt that a heart to heart talk before such a meeting as this would be conducive of better understanding and that during the discussion which naturally follows such a paper, many points concerning the drive and its operation could be cleared up.

It is possible that no other industry has tolerated the use of the old types of mechanical drives with its line shafts, counter shafts, pulleys, belts, gears, clutches, etc., so long as has the paper industry, and in my opinion the only reason the old method of drive has remained in use so long is because it was until recently about the only way that power could be applied to the paper machine. Its efficiency is low, its maintenance is high, and with the new types of sectional drives now in the market, I believe it will rapidly be replaced by the more modern and more efficient method, which will result in more efficient and flexible drive, and which will also permit of an analysis of production cost not possible with the old type of mechanical drive.

The paper machine is of course, the most important machine which we have to deal with in the industry as the entire production of paper is dependent upon it, consequently I believe that too much attention cannot be given to the method of applying power to this particular machine.

There isn't any doubt but what the quality and the quantity of the product depends very much upon the type of drive selected, and the proper application of it with respect to the paper machine. Speed regulation, flexibility of control, and of course, continuity of service are all important factors.

Only Single Current Until Recently

Until recently electric drive on paper machines consisted of a single direct current motor either belted or direct coupled to the variable speed shaft of the machine, simply replacing the engine so to speak. With the above arrangement, the various sections of the paper machines were connected to the variable speed shaft through pairs of cone pulleys, to permit of the necessary draw between sections. This direct current motor received its current from a generator which in turn was driven by either a constant speed steam engine, a turbine or an electric motor. In the latter case, the generator and the motor were arranged as a motor generator set. Such a GE drive is installed at Wausau on the 1000' machine.

The varying speed necessary to operate the paper machine for various weights of paper, etc., was obtained by varying the field and voltage on the generator. This method of control is the most successful method of regulating the speed of direct current motors where extremely close regulation is required.

The above method of driving paper machine was an improvement on a variable speed engine as it permitted a much wider range of paper speed and much closer regulation.

The above type of electric drive is being successfully used in a great many mills in the United States and Canada. We believe, however, that while this type of drive was superior to the variable speed engine drive, it is in turn inferior to the so-called sectional drive that will be explained later.

A great deal of time and study has been devoted to the drive of the variable speed end of a paper machine and indeed it is no mean task because the requirements are very exacting and perhaps I could better illustrate what it means to put individual motors on each section of a paper machine.

No. 27705 represents, we will say, a paper machine drive, Circle A being one section of the dryers and Circle B the couch. Circle A is practically 100 per cent fly-wheel load while

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Circle B is practically 100 per cent friction load. We are now asked to direct connect a motor driving pulley "A" and another motor driving pulley "B" and over these pulleys we are to use as belting a single sheet of news print, perhaps 50 per cent dry and run these two motors and pulleys 24 hours a day without breaking the sheet of paper which represents the belt. Not only this, but each of the motors driving pulley "A" and pulley "B" may be subject to as high as 20 per cent variation in load either up or down, and when this change in load comes, neither motor must fall out of step with the other for if they did, they would, of course, break the belt "C". Not only this, but those motors must be designed to very close speed regulation and have a speed range possibly as high as 10.1 and while the motors must run at slightly different speeds on account of the stretch and draw, they must maintain the same relative speed. In addition to all the above, the problem is still more complicated by having six or eight of these motors instead of two and in addition to this, any of these motors must be so designed as to permit any particular section of the machine to be speeded up or slowed down slightly for adjusting draw and you must do it without disturbing the rest of the motors or without breaking the belt "C".

Only Practical Method

The above problem certainly looks impossible and we do not believe it is a problem that can be taken care of by any known regulator or corrective device because it seems to us that no corrective device can bring one of these motors back into step, when a change in load comes on to it, quick enough to prevent a break in the paper. We believe that the only practical method is one that will prevent the motors from falling out of step in the first place, or in other words, a method that will take up the shocks or the changes in load and keep them off from the main direct current motor to slow down or speed up with a change in load.

The shortage of news print as well as other grades of paper brought on the high speed craze and the trade began to call for higher speeds and heavier machines. The paper machine manufacturers expressed their doubts that they could reach the high speeds demanded with such heavy machines unless a new method of applying power to the paper machines was discovered. It seemed essential to eliminate the belts, gears, and clutches with their overhigh maintenance and loss of power, if this demand for high speed and greater production was ever to be realized.

This created the demand for the individual drive on the various sections of the paper machine. The electrical manufacturers responded with the so-called sectional drive. Some 12 years ago the paper mill specialists of the General Electric Company conducted certain experiments on a form of sectional drive and demonstrated its practicability for any and all types of machines, so they were well provided with data regarding the difficulties we could expect in motoring a paper machine. This statement is not idle talk as I have only to refer you to the Crown-Willamette Paper installation which was sold, designed, shipped and installed in something like ten months and which is operating today without a single modification over the plan originally laid out by the engineers. This drive at Crown-Willamette Mill started off at 700 ft. which I believe is a high speed record for starting a new machine of any kind.

Several types of drive are now on the market which differ materially from each other. We believe that no form of paper machine drive can be successful that incorporates any type of speed governor, that does not function until after a change in speed takes place. It seems to us that the ideal drive is one so designed and built that a change in speed is prevented rather than corrected after it has taken place, as there is always the possibility of breaking the sheet before a regulating device can function.

Further, we try to keep in mind the idea that the equipment must not be complicated and its method of operation must be such that it meets with the approval of the men responsible for production and the men operating the paper machine. The control must not depend on contacts, regulators or any similar devices for, as you know, the air in the machine room is often humid and contains more or less oil. The failure of one contact making part to function would cause breaks and might even shut down the entire machine.

Does Not Depend On Regulating Device

We believe that the General Electric drive is entirely different as it does not depend on any regulating device or contacts. With the use of the synchronous machine to absorb all changes in load that come on to any part of a paper machine, it prevents a change in speed from taking place as it keeps these changes in load off the main direct current motor. Consequently, as no change in speed takes place, the drive does not have to correct for it. I would call this drive a preventative drive and not a corrective one.

In designing and building this drive, we have kept in mind that a paper machine drive should be as simple and as rugged as possible and free of all delicate apparatus if we are to get continuity of service which is so important in a paper mill. There is not a single thing in the General Electric equipment that is not standard, units that we have been building in our shops for years but differently applied.

The paper machine would be started up one section at a time with the drum controller, any section can be reversed for spearing brake or releasing a plug in the calender stack.

Of course, no drive can make paper successfully if the relative speed of the various sections varies with relation to each other. The motors must be synchronized and free from any individual change in speed.

Many Advantages

We believe there are many advantages in favor of the sectional drive over any other type such as saving of power, reduced maintenance cost, continuity of operation, and inasmuch as closer regulation can be maintained, many breaks can be eliminated that theretofore have not been generally attributed to a faulty drive. If this is true, production should be increased somewhat.

One of the most prominent paper mill men in the industry, and a man known to most of you present if I were at liberty to mention his name, has stated that for every ton of paper made on his high speed machine with the old Marshall Train drive, there is a corresponding cost of from 30 to 35 cents a ton for belt and oil maintenance alone. On a fifty ton basis, 300 days a year, this is 10 per cent on $52,500.

There are many other advantages incidental to this drive, in particular, the ability to slow down any or all of the presses during the wash up period and the very slow speed of a few feet per minute for inspecting the wire, for spotting the dryers, for sewing tears and for putting on new dryer jackets and carrier rolls. The reversible feature of the drive is also of advantage in handling the clothing on the dryers.

We believe this type of drive will become more popular from year to year as soon as its advantages become more generally known to the paper mill men.

If there are any questions or any points that I have not made clear relative to this paper machine drive, I would be very glad to invite discussion.

DEVELOPMENT OF PULP AND PAPER MILL SCREENS*

By Phillips Dennett of the Bird Machine Co., South Walpole, Mass.

Please take this paper as nothing more than a collection of notes on pulp and paper screens. They are made up partly from the experiences of the company with which I am connected. We have been at the screen business for nearly twenty years, and I think we can say modestly that we have learned some things—some, I can assure you, by traveling a hard, rough road. I have also had the benefit of extremely useful data which a number of our paper mill friends have been good enough to give me out of their experience. In no sense is this intended to be a scientific paper. Perhaps it is unnecessary to say so, but I want to avoid any possible misunderstanding. One paper maker warned me by saying in about these words: "The subject of screens is rather a difficult one to write on; practically every one connected with the business has a different idea." I suppose this is pretty much so, and I am a little concerned about it, but I am going ahead with my own views confident that you will receive them in the spirit with which they are offered, and that where we may not agree you will, through discussion, give to me and to your membership the benefits of your own experiences and beliefs.

History of the Screen

The background of history may help to give a better perspective on the present. A hundred years ago there were no screns. An effort was made to keep the paper free from the mechanical impurities we now call dirt by careful preparation of the rags from which all paper was made. The lumps and knots were removed from the paper, not before but after it was made. The sheets were gone over by hand and the knots removed by picking them out with a penknife. The first screen of which I find any record is one invented by Richard Ibotson of England about 1830. This was a screen in which the box containing the plates was vibrated. It was the forerunner of the knocked type of flat screen, which was almost exclusively used in this country up to about 1890 to 1895. The diaphragm screen soon followed, but it was not perfected and had no great sale while the knocker screen flourished. When it did find itself and get under way, it quickly replaced the knocker screen. For one thing, it was very much cheaper, both to manufacture and to use; for another thing, it was about that time that wood pulp came into widespread use, and the conditions of screening were easier. With all its noise and expense, the knocker screen had a highly developed ability for putting long rag stock through fine cut plates, and many a superintendent whose paper-making memory is long enough has now and then a wish that he had his Gould screen back.

Rotary screens date back to about 1860, when Christian Wandel, a German, invented the original Wandel screen, an outward flow type. About the same time there were invented inward flow rotary screens, of which George Bertram of Edinburgh brought out one of the earliest, if not the first. To me, the important thing about this is not accuracy concerning the date or the original inventor, but the fact that rotary screens of both types have been known so long and yet until so recently left undeveloped. They did soon become the screen commonly used in European countries, but they were never used in the United States until well into the present century. One or two of the German or British screens had been imported before that time, but these were not successful, mostly because the European design was unsuitable for the much harder mechanical conditions imposed by American mills. The same reason held back for a long time the development of rotary screens, after they were first manufactured in this country about twenty years ago. The mistake was made of depending too much on the success of the various screens in the mills abroad, and the error persisted for years before it became apparent that in order to utilize the full value of the rotary principle, it would be necessary to devise a form of construction suitable to the particular demands of American mills. It is only in the last ten years that great progress had been made.

Following the development of wood fiber and the establishment of pulp mills as the chief source of supply for paper making fibers, wholly new demands were made on screening apparatus. This does not seem to have been quickly realized, and for what seems like a long time the pulp mills used exactly the same kind of screens as were used in paper mills, first knocker screens and later flat diaphragm screens. It was really the beginning of the present century before screens were developed for the particular needs encountered in the screening of pulp, and it is only in the last ten years that pulp screens have been a great success.

Big Development in Last Ten Years

Perhaps it is partly because my own experience covers this particular period, but, whatever the reasons, I am of the opinion that more has been done to develop the screening of both pulp and paper in the last ten years than ever before. This may be a very natural result of the fact that during this time certain machine builders have made a business of screens, usually specializing on the screens for one of the several distinct fields. It is perhaps worth mentioning as a point of difference between earlier screening methods and those of the present day that, up to twenty years ago, one type was generally used for all kinds of stock and conditions of screening. Today there is a type of screen which is purposely built for each type of work.

In discussing present types of screens it is perhaps convenient to classify them into two broad groups—pulp screens and paper screens. In some cases the same screens may be used for both kinds of work, but this is not general, nor, by and large, productive of the best results. It may also be well to consider briefly the difference in the requirements which have to be met. Purely as a mechanical matter, screening pulp is very different from screening the stuff for a paper machine. To begin with, the physical characteristics of the fiber in the pulp mill are in most cases different from the fibers found in paper mills, with one large exception—news print mills, where the stock is handled continuously in slush form. Without exception, there is another great difference; the amount of tailings which have to be removed. The stock which is delivered to the screens in the pulp mill carries from six to ten per cent of tailings, while in the case of paper machine stuff, the amount of materials to be rejected is a small fraction of 1 per cent. This is an extremely hard condition which the pulp screen has to meet. On the other hand, the pulp screen has an advantage in this respect, that the stock can be diluted to any consistency desired. The paper screen is often handicapped by lack of water, the limit of dilution being that which can be taken care of on the paper making wire. The screen is thus governed by the paper machine and cannot be handled as might be best if it were working independently, as the pulp screen does.

The primary function of the paper screen is quite apart from the removal of a large quantity of tailings, as in the case of the pulp screen. Going back into history, we find the early screens called "pulp dressers," "knot catchers," or "knotters." Their object was to supply the paper machine with fibers well separated from each other as well as from the knots or bundles of fibers that were not reduced in the beating process or had gathered themselves together while on their way to the paper machine. A paper screen is a comb, as well as a knot catcher. It is also true that the paper

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screen should remove mechanical impurities of one kind or another, generally called dirt, which have in some way got into the stock, but this is almost incidental. The major duty of the paper screen is to put on to the paper machine wire a supply of stock which will be a honogeneous mixture of water and thoroughly separated fibers free from knots or slugs or slime.

Two Chief Types of Pulp Screens

Considering pulp screens, there are two types chiefly used, centrifugal screens and inclined diaphragm screens. A Bird type, the inward flow rotary screen, has been used to some extent mostly in Europe, but it has not gained any large success. It will be considered later as a paper screen where it is perhaps the outstanding type. By far the largest tonnage of pulp made is screened through centrifugal screens. This includes news print sulphite, other number two sulphites, sulphate and soda pulp, mostly the pulps which are made to be used by an adjoining paper mill, and not to be sold. This type of screen is very interesting as a foundation for future development. It is compact, of great capacity, and very well perfected, from the mechanical viewpoint. The chief disadvantages for the engineering of the future to overcome are these: First, the inability to screen pulp clean enough for number one quality, and second, heavy power consumption. Developments of the past ten years, however, offer good grounds for hope that much may be expected in the next ten years to come. The other largely used type of pulp screen is the inclined diaphragm screen, which I think holds its place largely because of one very valuable feature—its ability to produce number one pulp of the cleanest kind. It is used by most mills making high grade pulp or almost any pulp for sale in the market. Most of the foreign pulp which is imported for our paper mills is made through this type of screen. The diaphragm screen as made today is vastly improved over similar screens of a few years ago, but it does not seem to offer the same hope for the future as does the centrifugal screen.

Three Classes of Screens

The paper screens in use today group themselves into three broad classes, the flat diaphragm screens, outward flow rotary screens and inward flow rotary screens. The first was almost exclusively used in this country following the exit of the knocker screen, and until about fifteen years ago. It is still the most common in use, but the other types, especially as developed in the last five years, have made great strides. Flat diaphragm screens can be used and are used on almost every grade of stock, although the operating difficulties increase as the fiber is longer and wetter working. They hold their place, I think, largely because first, they are cheap, for on a great many stocks they permit the use of extremely fine plates and because in a place where it is necessary the plates can be quickly changed. The disadvantages, however, are really great. The screen plates fill up and get foul on the bottom side, causing lack of uniformity in the flow of stock, and, what is more serious, pass slugs and slime to the paper machine, which cause breaks and necessitate shut downs for washing up. Often the use of flat screens entails the employment of labor to rake the top of the plates. This is not only a great expense but it is a job in the mill which ordinarily is hard to fill. Mechanically the flat screen is open to the same objections as is the inclined diaphragm screen referred to under pulp screens, and the operating cost is high. In general flat screens do not seem to be the paper screen of the future.

The outward flow rotary screen, for years as common in Europe as the flat screen here, and the first rotary screen to be manufactured in this country, was at first applied on various grades of stock, but has now found its proper place as the screen for long, wet working fibers, such as that obtained from rags or manila rope. It is particularly valuable on ledger and bond paper, rope manilas, rag or jute tissues, as well as on any light weight papers which are made in small capacities. It will work on any grade of stock, but it does not make an economical installation on the majority of grades, because its capacity is low. In action it is nearer to the knocker screen than any other type, which I think is one reason why it works so well on long stock. Mechanically, it has been well developed, and it is now a very cheap screen to run. It is, I think, a very logical type of screen in its particular field, and I judge its popularity will continue to increase.

The third general type of paper screen, the inward type of rotary screen, has come into its own in the last five years, and is perhaps the real sensation in paper screens. As an evidence of its popularity already about 8,000 tons of the paper which is made each day in the United States and Canada are made through the screens of this type which are built by the company with which I am connected. The inward flow type of screen can be used on almost every grade of paper, and to some extent it is used on rag stock and long, wet working stock, but in general it is not. It operates best on the kinds of stock which have shorter fibers and carry plenty of water, such as papers made from pulp and paper stock, which means of course the bulk of the paper made. Some paper makers seem surprised that this type of screen works well and pays its way in board mills and mills making similar coarse papers. In fact, it does, and as great economies and improvements have been effected in board mills as in any other class.

Great Majority of Troubles Overcome

Reverting to the general case, the inward flow rotary screen has, from an operating viewpoint, overcome the great majority of troubles which a few years ago seemed to be inherent in screens. Like all rotary types, it provides for automatic cleaning of the screen plates, troubles due to strings, lumps and slime are almost unknown, there are very few breaks that are caused by the screens, and under most conditions the screens never cause a shutdown for washing up. Uniformly good paper can be made continuously from day to day. In many mills the screens are washed only on Sunday. From a mechanical viewpoint, the inward flow rotary screen has been well developed; it gives little trouble and the operating cost is low from every viewpoint—power, plates, attendance and repairs. The chief disadvantage or hindrance to sale at the present time seems to be the high cost, as compared to flat diaphragm screens, but this, after all, means nothing more than charges for interest, taxes, and depreciation, which are not serious factors in manufacturing cost. At present it looks like the leading type of paper screen and I think that we shall hear much more of it in the future.

I can think of nothing better to leave in your mind than the parting shot of that famous paper maker, Karl Hoffmann, in the article on screens in his original treatise on the Manufacture of Paper, published in 1873. What he says has been good for forty-eight years, and I think it will be good for many times forty-eight more. I quote: "The frequent examination of the screening is to the foreman a guide for the improvement of all preceding operations. If too much rubber, sealing-wax and similar substances are found, it is an evidence that the rags or waste papers have not been sorted as carefully as they should have been. If lumps of fibers, rags or paper are found, the engineer is to blame for not stirring the pulp often enough, or for allowing it to leave the beater without having been thoroughly brushed." Hoffmann's comment needs a little adaptation for pulp and paper mills of our day, but I think he would say to you in these times that for many of your screen troubles you should look to your raw stock, your beater room, your rag room, or, in the case of the pulp mill, your wood room. Your screens are of great importance; they have an enormous effect on the outcome of your work, not only in respect to quality, but also with direct bearing on the quantity of production; yet, by and large, the quality of your paper must be determined elsewhere.

MANUFACTURE OF SULPHITE PULP IN EUROPE*

By O. L. Berger, of the G. D. Jenssen Co., New York

Outside of Keller's invention of groundwood in 1844, no invention has done more to develop modern papermaking than the one by the American Chemist, C. B. Tilghmann, in 1866, which consists of separating cellulose from wood by the chemical action of calcium-bisulphite solution, in other words, the manufacture of sulphite pulp.

Like many other pioneers, Tilghmann did not make a financial success of his invention as he was unable to manufacture sulphite on a commercial scale. This was first done by a Swede, C. D. Ekman in 1873, and a German, Doctor Mitscherlich in 1874, so the honor must be said to belong to these two gentlemen.

Several sulphite mills were in operation in Europe before George N. Fletcher built the first Mitscherlich mill in the U. S. A., at Alpena, Mich., in 1887, which is still running and is known to everybody as the Fletcher Paper Company. The first quick cook or Ritter-Kellner mill on this continent was built at Cornwall, Ont., 1885, and this mill has run to this year when it was replaced by a modern mill by the C. Howard Smith Paper Company, the present owners.

Much honor belongs to the two Swedes D. O. Francke and C. W. Flodquist for pioneer work in developing suitable machinery and equipment, as well as the practical methods for cooking and acid making.

As we see, the Europeans had several years start, and it is therefore to be expected that their methods were developed earlier than ours. Today there are several mills on this side of the Atlantic turning out sulphite fully as good as in Europe, but even now we regard foreign pulp as standard for strength, color and cleanliness.

It can generally be said that the American sulphite mills are after quantity and the European after quality, and their methods are therefore developed strongly along lines serving their different purposes. For quantity we need labor saving machinery and automatic methods and these are today highly developed on this side, while in Europe more pains are taken in carrying out all the operations with the highest quality of the product in view. Much of the European pulp is made for export and this is of course the reason for this special care.

Woods Operation

The manufacture of sulphite really begins in the woods and the initial step is the cutting of the tree. It is therefore not amiss to follow up the methods used in Europe and if there is anything we can learn from them it is indeed here. In my opinion, efficient woods operation and reforestation is a national problem second to none. Denuded land means not only that we run short of raw material for paper but it means a barren country as forests are imperatively necessary for agriculture and steady flow of rivers. We cannot go into details but it is enough to say that they have very strict laws regulating minimum sizes of trees that can be cut, as well as leaving of seed trees or guard trees compulsory cutting of which may be called weed trees, and especially cleaning up of slashings and planting of trees. Their forest patrol is also compulsory and in case of forest fires the local fire brigades are called out at once.

The trees are cut low to the ground and in case of high snow this is cleaned away and we don't see the breast high stumps so often seen in our forests as a silent token of the careless operations of our lumber camps.

When the trees are felled all branches are cut off close and several strips of bark sliced off the full length of the log. This is done to facilitate the natural barking of the log in the river as it is floated down to the mills, and it is generally found that by the time the log reaches the piling place nearly all the bark is removed.

Wood Yard

As it is customary to store the logs a long time, in some cases for two years, it can easily be seen that this removal of the bark is very important. As the logs season quickly and there is less danger of worms spoiling the wood, it is customary to store the logs on concrete piers well off from the ground and this also helps to keep away dirt and fungus. The piling is done systematically in straight layers with stringers in between which insures perfect air circulation, and for the same reason the individual piles are separated by wide aisles which also serve to guard against fire. In this country we often find the pulpwood thrown into some swampy hole that is no good for anything else, while over there they pick out a high and dry place, realizing that good wood is essential for a good product and that 10 per cent of the value is easily lost each year if the wood is not properly stored. Under favorable conditions it is possible to obtain chips containing only 20 per cent water by this method of storing logs, and every sulphite man will readily appreciate what this means in production, yield and use of chemicals compared to 45 and 50 per cent which is often the case in American mills.

Wood Room Operation

The logs are generally barked on knife barkers of a type equipped to take the full length stick 8-12 feet. The dark skin caused by the long seasoning together with any remaining bark is carefully removed and drawknives and axes are used to cut out defects of any kind, liable to show up in the finished pulp. For this reason they generally use more help in this department than we are used to, but this is found to be a good investment. The chipping is done very carefully and we find that they run their chippers much slower than we do, often so slow that they get only 360 cuts per minute. In this way they get practically uniform chips which after screening contains a minimum of sawdust and slivers.

Cooking

The Norwegian Mills generally cook with direct steam, while the Swedes and Fins use coils in upright digesters. Their cooking time is around 15-18 hours with a maximum temperature of 130-135 degrees C. The pulp is seldom blown out but the pressure released, the liquor drained off and the pulp is washed in the digester. This takes time and it generally takes four hours to empty and fill. By this method they insure against disintegrating any black knots or uncooked chips and the pulp is like what we are used to seeing in Mitscherlich mills when it reaches the blow pits. The strength of their cooking acid is generally lower than here and goes seldom higher than 4-3-1 for direct and 3.25-2.25-1.00 for indirect cooking. As all pressure is released before blowing all gas can be recovered and we find that a sulphur consumption of 10 per cent or 200 pounds per ton sulphite is the average.

The digesters are very often lagged with insulating material, and I think that this, in connection with the careful cooking and low temperature is responsible for their low steam consumption. On this side it is customary to use from 4 to 4½ pounds steam per pound pulp, while in Europe some mills use as low as 2.8 pounds.

Many mills steam the chips in their digesters before filling with acid. The steam is admitted at the top and a bottom valve is kept open to release the condensate which generally is full of pitch and turpentine. This steaming is claimed to be of advantage as it makes the chips uniform in moisture and causes them to ab-

*Read at the Spring Convention of the American Pulp and Paper Mill Superintendents' Association, Waldorf-Astoria, New York, June 3-5, 1921.

sorb the acid very rapidly when it is filled in under a partial vacuum. It also helps to increase the yield and the uniformity of the pulp. A slight superheat of 5-10 degrees C. is often used to insure dry steam but higher superheat is not regarded as safe.

Wet Room

From the open pits the pulp is conveyed with automatic shovel arrangements to "openers" where the fibre bundles are gently separated between wooden rolls inserted with fingers. This guards against crushing of knots and raw chips. After the pulp is "opened" it is run over knot screens and invariably over rifflers which removes undigested chips and heavy particles. For screening they use flat or rotary screens. The Spangenberg screen which uses slotted plates and the rotary principle with inside pulsation is installed in many mills and gives excellent results. We also find American flat screens of the Gotham and Harmon type and a variety of rotary screens like those found in our mills. The rotary screens seem to give better results than we are used to, and this no doubt is caused by the fact that the pulp contains less dirt and slivers to begin with. The pulp seems to be more easily screened than American pulp and it is customary to figure six ton per 12 plate flat screen. The reason for this is that the fibre bundles are thoroughly separated by the opening process and that a majority of knots and slivers are removed before the pulp is screened. After screening the pulp is most generally run over drying machines for export. An innovation in drying machines and wet machines is the Kamyr press in connection with a rotary suction cylindermold. With this equipment it is possible to get a pulp 50 per cent bone dry without the use of clothing. If this pulp is run over dryers it is possible to save 30 per cent of the steam and if shipped as wet pulp the saving in freight is considerable. The Kamyr machine is installed in a majority of the Scandinavian Mills and Finnish Mills, and will be introduced in this country this summer.

Acid Plant

All the mills are using limestone systems, the majority the high Mitscherlich wooden towers, while lately the Jenssen two tower concrete towers are being installed in Mills in Norway, Sweden, Finland, Belgium and Germany. Pyrites has been used almost universally until recently, when it was found that the price of Pyrites was too high to compete with American sulphur especially when the expensive installation and upkeep of pyrites burners are compared with the simple and inexpensive rotary sulphur burner. It would be interesting to discuss the pyrites burning more generally but as there is no chance of it ever being introduced in this country with our apparently inexhaustable supply of nearly chemically pure sulphur, I shall not take up any time doing it. I will, however, mention a gas cooler which is used in connection with pyrites. This consists of a tower filled with chemical rings something like a recovery tower. The gas enters at the bottom and meets a stream of water whch cools the gas directly. This stream of water is regulated so that the gas goes out stone cold and the water leaves the bottom so warm that it gives up any SO2 gas which it may have absorbed in its direct contact with the gas. Whether this is going to be used for sulphur remains to be seen as any sublimation must be guarded against because it would clog the tower. This I expect will be worked out on the other side very soon, and if it is successful I expect to see all expensive lead pipe coolers discarded. This cooler is also said to wash the gas absolutely free from sulphuric acid.

Recording SO2 instruments are used in nearly all the mills and great pains are taken in keeping a uniform gas which of course is much harder and much more essential when pyrites is burned.

The reclaiming is done about like we are used to either in the tank or towers.

They use brick lined steel vessels for acid tanks which are able to stand considerable pressure and for that reason their reclaiming is more efficient than if wooden tanks were used.

By-Products

I visited a sulphite mill in Germany where I was told they manufacture fifteen different by-products from their sulphite liquor varying from alcohol and colors down to chemically pure carbon for medical purposes. These by-products plants represent a very large investment and it is very doubtful if any American manufacturer is willing to go into this line of business at the present state of affairs. Many alcohol plants were built as a war measure as the alcohol mixed with benzol makes an excellent motor fuel and gasoline was very scarce, but at the present time most of these plants are down. The different processes for the manufacture of coal from sulphite liquor are not entirely successful although they still are experimenting and running some plants on a commercial scale. Some mills are also making tanning material and adhesives for corebinding and briquetting, but with more or less success. The real great work done in this line is the manufacture of alcohol according to the Wallin Ekstrom process, and under ordinary conditions with cheap coal and full production, I am sure that the majority of the European Mills will be running alcohol plants in competition with gasoline and also for beverage purposes.

COOKING OF SULPHITE PULP*

By Benjamin T. Larrabee, of the S. D. Warren Co., Cumberland Mills, Me.

It is a well-known fact to all superintendents of sulphite mills that the cooking of sulphite pulp involves a number of problems of a variable nature, and that there are almost as many methods of cooking sulphite pulp as there are mills using the process.

At this point, I want to make it perfectly clear to all that I realize that there are several different grades of paper that require the manufacture of as many different grades of sulphite pulp, and that each of these processes must be handled in a manner to produce a grade of pulp that will be desirable for the particular kind of paper to be manufactured.

Fundamental Principles Alike

The fundamental principles of cooking are practically the same in all mills, but it is in connection with the numerous details during cooking that we find wide variations in operation.

For example, one mill desires to use an acid that tests 6.00 per cent free SO_2, another is satisfied with a 4.00 per cent free SO_2. Some other mill wants a 1.2 per cent SO_2 combined while some believe that .9 to 1.00 per cent SO_2 gives the best results. Still another mill believes strongly in a side relief while another superintendent refuses to use it. There is a variation in opinion as to the proper amount of pressure to use and to what maximum temperature the cook ought to be brought. Some mills start to reduce the pressure on a digester at a certain stage in the cook while others do not.

I am going to mention now what to me seems to be at least one of the most, if not the most critical problem in connection with cooking that we face, and one in which is involved a very serious difference in opinion, and that is the determination of the completion of a cook.

There are several different ways used in mills to determine the blowing point of a digester. Those most commonly used are color, which consists of either just simply holding a sample of

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the acid drawn in a glass before a light or making a comparison with a standard color; smell, testing volumetrically with a standard solution of Iodine using a starch indicator; or by drawing off a sample of stock from the digester periodically, washing it, and noting the action of bleach on it. All of these methods are in use in various mills and each one has its ardent followers who believe that the particular method they use is the right one.

There are still other variables that have a more or less important bearing upon the cooking of sulphite pulp. There is the manner in which the steam enters the digester. Some mills use only one inlet for steam, usually directly in the bottom, while others use several inlets located in favorable positions so as to insure complete and thorough circulation. There are two methods of filling a digester with acid, through the top and pumping into the bottom.

Different Methods of Handling

After a digester is brought to pressure there are several different methods in the operation of handling them. In one mill that I visited, as soon as a digester is at pressure the "cold gas" is relieved and the digester is then shut in for an hour following which the relief valves are again opened and they proceed with the cook. On inquiring why this method was pursued I was told that by experimenting it was found that a very much better grade of pulp was produced by this method of procedure, and that the theory was that by shutting the digester in for an hour at that particular stage of the cook, the action of the acid at a high strength was responsible for the improvement in the grade of pulp.

It is a well known fact that the variation in moisture in the wood and the kind of wood is an almost unavoidable variable and one that has an important bearing on the cooking of sulphite, as does also the size of the chip and the uniformity of the chips.

I imagine that up to this point in my paper that all sulphite superintendents are wondering why I have brought out these several variables that exist in the cooking of sulphite pulp, for to them it is a review of facts that they have encountered and know well.

Superintendents Should Get Together

My real objective in bringing these facts before you in this manner is that I firmly believe that the time is ripe for the superintendents to get together, exchange ideas, study carefully all problems connected with the cooking of sulphite pulp and other processes connected with a sulphite mill, and bring about insofar as it is possible the standardization of the cooking of sulphite pulp. This can be accomplished only by hearty co-operation on the part of all superintendents and a lot of hard, conscientious work on their part. It would mean that superintendents of sulphite mills producing pulp for book paper would adopt one standard, those producing pulp for newspaper another standard, etc, right down through the trade. By getting together in this manner I should expect to see most of these variations in the operation of sulphite plants reduced to a minimum, and ultimately increase the efficiency in operation and bring about the production of a better grade of pulp. The Superintendents' Association is the ideal place for the solution of a problem of this kind and I sincerely hope that in the future we may be able to so organize as to take up this sort of work. It will be invaluable to the pulp and paper trade as a whole.

Cooking Sulphite for Book Paper

Up to this point what I have presented to you has been more along destructive rather than constructive lines, but with your permission I will give you an outline of some features that have a direct bearing upon the cooking of sulphite pulp used for the manufacture of book paper.

Ordinarily the wood as received is a mixture of spruce and fir with a varying percentage of hemlock. This wood should go to the wood room in a uniform state so far as moisture is concerned. Usually as the wood is received there is a large variation in moisture and I believe that it ought to be piled in the yard and allowed to season and dry out to a uniform moisture and delivered to the wood room in this condition. Wood of this nature would aid greatly in the production of uniform pulp. Uniform wet wood would produce equally as uniform a pulp but dry wood would be preferable from the standpoint of strength of acid and consumption of chemicals. If any hemlock is present it should be piled at one side and when enough has accumulated to warrant its use it should be used by itself. This should insure a more uniform product for it is a known fact that hemlock should be cooked differently than fir and spruce.

The speaker believes that for cooking a 5/8-in. chip is desirable, and that extreme care should be taken with chipper knives, bed knives, chipper screens, etc., to produce as uniform a chip as possible.

Pumping the acid into the digester through the bottom has a tendency to prevent the chips from settling and thereby helps to bring about more complete circulation in the digester which tends to a more uniform pulp.

I believe that a good standard strength of acid would be 6.00 per cent total, 4.90 per cent free and 1.10 per cent combined. A combined of this strength insures the use of a minimum amount of bleach and also is high enough to guard against any irregularity in the operation of the acid plant, such as a shut down or running into a bad lot of lime, for it is a well-known fact that when you drop the combined below .9 per cent SO_2 you are treading on very treacherous ground and that the quality of your pulp is bound to be inferior and the digesters will handle differently.

I believe that the steam pressure at the boilers ought to be about 150 pounds pressure and delivered through as small a pipe as is practical thereby insuring steam with a minimum amount of water. On some type digesters there is perhaps nothing gained by having the steam enter through a number of nozzles distributed properly, but such an arrangement is desirable for the reason that complete circulation is a vital step in producing a uniform pulp.

The pressure used and the time taken to come to pressure depends upon the moisture in the wood and the kind of wood. There is a certain maximum temperature which both from a commercial and economic standpoint should not be exceeded in cooking both from the standpoint of yield and strength of pulp. The writer believes that 300° Fahr. should not be exceeded and that 290° Fahr. would be a desirable maximum.

In determining the completion of a cook it has been my experience that the color indication is indispensable also the volumetric test with a standard solution of Iodine, and that the combination of these two is a good indicative of the blowing time.

Conclusions

At the beginning of this paper I endeavored to impress upon your mind some of the variables we are now facing in the cooking of sulphite pulp, next I gave you my reason for doing so and brought out the fact that the superintendents of the association should organize with the idea in view of standardizing so far as possible the cooking of sulphite pulp together with the other processes connected with a sulphite mill. Following this I very briefly outlined my views on the cooking of sulphite pulp used for book papers, attempting to present to you conditions that with my present knowledge of the game I would consider ideal.

In closing I want to thank you for the patience you have shown during the reading of this paper, and once more I am going to take the liberty to emphasize the fact that I sincerely hope that the superintendents of sulphite mills in this association will get together more frequently in the future that we may exchange ideas, thereby insuring a better understanding of our own process, which must necessarily react favorably for the benefit of the paper maker.

RUBBER ROLLS*

By R. B. Adams, of Stowe & Woodward, Newton Falls, Minn.

Rubber rolls are a special branch of the great rubber manufacturing industry. I intend to tell you something of the early history and development of the rubber roll business, how they are made and something about the characteristics of rubber rolls including their diseases and how to prevent them.

The growth of the rubber industry is like a fairy story for rubber is indeed a magic substance. The early explorers brought home small pieces of a strange gum as curiosities and noticing that it would rub out pencil marks, it was called "rubber." This property is now the least important one it possesses. The other properties which have made it so valuable to us are first its elasticity and the fact that it is water-proof and air-proof as well as the fact that it is an insulator of electricity and that it is not destroyed by acids, alkalies and other chemicals as so many other substances are. Furthermore the discovery of vulcanization and the fact that it lends itself easily to combination with many other substances and is easily formed into all shapes and forms, makes it useful for numerous kinds of products.

Vulcanization

Vulcanization is not understood by all. Some people think that only hard rubber is vulcanized rubber because it is often called vulcanite, whereas all rubber goods are vulcanized. Vulcanization is the chemical union of rubber and sulphur which takes place under the influence of heat and usually pressure with the result of improving its physical properties. It is more elastic, is less affected by heat and cold, is more resistant to the destructive action of various chemicals and its ability to resist age is increased. If you were to try to wear a rubber suit of unvulcanized rubber, it would be sticky on a hot day and stiff like a tin suit on a very cold day. After being vulcanized, it is but little affected by either heat or cold. If you stretch a piece of unvulcanized rubber compound it is like a piece of spruce gum but after being vulcanized it is tough and so elastic it will spring back as quick as a flash when released. This property of being elastic, yet strong is its most important property and one that is possessed by no other material in nature. Every one knows rubber is obtained from the sap of a tree that grows in hot countries, somewhat like the making of maple syrup. It used to come from the wild forests of South America and Africa and there are as many kinds of rubber trees as there are apple trees, each yielding a rubber of somewhat different properties. Today most of the crude rubber comes from Ceylon and the Straits Settlements, from orchards or plantations artificially set out. In such plantations they grow only the best species of rubber trees, and the history of how they obtained seeds from the para rubber trees against the opposition of the Brazilian Government, of sprouting them in English botanical gardens and finally starting orchards in Ceylon is an interesting story. The great rubber plantations of the Far East are all direct descendants of those original experimental trees and have so increased in output that the world's rubber industry would feel no jar if no more rubber came from Brazil and Africa. These plantations are run on a scientific basis. The sap which looks like cow's milk is collected and handled in porcelain lined vessels and kept clean like in a well kept dairy farm. In fact, the process is like making cheese. The addition of an astringent to the milk throws down a cord like a cheese and this is rolled into sheets, dried and smoked and is our principal raw material. It is so clean it can be put right into the compound the same as a cook puts sugar into cake.

Crude rubber is the only raw material that did not go up in price during the war. It is cheap now and never can go to high levels again for very long periods of time. To get more rubber it is only necessary to set out more rubber trees. By the same rule, you can get more spruce pulp but instead of requiring half a century to grow, the rubber trees yield rubber after a few years and are tapped so as to prevent injury to the tree. This assurance of an inexhaustible supply of cheap crude rubber means that rubber articles will be used more and more, for the world's other raw materials, which compete with rubber are gradually growing dearer. Thus rubber rolls are cheaper than ever before the war and there is more reason than ever before that rubber rolls should be used in preference to competing types of rolls which are more costly than before.

Uses of Rubber Rolls

In many manufacturing processes it is necessary to quickly remove liquors from goods, and there are three ways of doing this: by squeezing, by evaporation under heat and by centrifugal force, as in a hydro-extractor. Common squeezing is the cheapest method and is universally employed to get out all the liquor possible and then the balance is driven out by one of the other methods. The simplest way to squeeze a material is to pass it between rollers; and to get a uniform pressure, it is obvious that some spring to the surface of the rolls is desirable. The first attempts were in using wood rolls or metal rolls wrapped with cloth and such rolls are still in use for some purposes. Years ago it was evident that rubber was the ideal material to cover rolls with if only it could be put on the surface of rolls so it would stay.

Among the industries where rubber rolls are now used are: paper mills, textile, dyeing and finishing plants, tanneries, tobacco mills, sugar refineries, printing plants, etc. In paper mills as you all know, they are regularly used on Fourdrinier machines for press and size rolls and often for wire guides for top and bottom couch and for wet felt carrier rolls. On the cylinder and board machines they are used for top couch baby and primary press and for felt wringer rolls.

It was easy enough to form a cylinder of rubber on a roll body but under pressure it would get loose. Many inventors tried to solve the problem and many of their attempts, as seen in the patent office files seem foolish today. The favorite way was to put ribs of metal on the body extending up into the rubber or to put on a skeleton of cloth or metal strips or wires in the rubber and anchor them to the body, but all these methods failed and the solution of the problem came in the discovery that hard rubber of certain composition when vulcanized to iron would adhere strongly to the iron and that softer rubber would likewise adhere to the hard rubber.

Sometime back in naming rubber's valuable properties, I mentioned the fact that it lends itself readily to combination with other substances. In other words, rubber is a "good mixer." This is true and this is very important for and not only will it mix with almost any substance but it partakes of the properties of that substance whether it be good or bad. It is only necessary to reduce a substance to a powder or paste or a liquid and it can be mixed with rubber. As

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almost anything can be so reduced, so almost anything can be compounded with rubber and this gives us an idea of the possibilities before the rubber expert and why the rubber industry has had such a great development of recent years. Substances mixed with rubber go in three classes:

1. Vulcanizing agents like sulphur which are necessary.
2. Substances added not to cheapen but to give certain desired properties.
3. Substances added to cheapen the compound.

High grade rubber rolls are composed of substances of classes one and two and mainly of class two, that is substances added to give certain desirable qualities such as toughness, resiliency, hardness, ability to age slowly and ability to withstand the action of acids, alkalies, oils and other chemicals.

Many people have no idea how rubber rolls are made and think they are cast the same as a lead pipe is cast. This is not so, in fact rubber is brought to a plastic condition where it can be shaped but it is never liquid. Some one is probably thinking, "how about rubber cement?" Rubber will absorb gasoline as a sponge does water and when it gets saturated it swells up and loses its fibre. If it is then stirred with a paddle it breaks down into an emulsion known as rubber cement. Evaporation of the solvent gives us back the rubber but the fibre is deteriorated.

The Process of Manufacture

The crude rubber, if from Brazil contains about twenty per cent water and impurities which must be washed out by passing it between rough surfaced rolls revolving at different speeds, on which a stream of water is flowing. The crude plantation rubber comes into market in a clean pure condition like the sample number one. It is broken down or made plastic by constant passing through heavy smooth surface rolls revolving at different surface speeds, the rolls being hollow and piped for steam or cold water. It usually takes about twenty to thirty minutes to get the rubber into a plastic condition after which the chemicals needed to make the proper desired compound are added to the mass of rubber on the rolls and in about a quarter of an hour when mixture has become homogeneous, it is removed from the mixing machine and put into a three roll calender with rolls about twenty-four inches in diameter and about five or six feet long which runs the batch of rubber compound out into a sheet or roll about ⅛ inch thick which is then rolled up with cloth between, to prevent it from sticking together, for at this stage it is hot and sticky like molasses candy and it is ready to apply to a roll body.

Up to this point, the process is similar to that used in the making of ordinary mechanical rubber goods, but from now on we follow the special process employed for covering rolls.

A properly constructed body is one made perfectly of cast-iron hollow in the centre. Solid steel may be used for small diameter rolls but rubber sticks better to cast iron. The hollow cored space in the centre should be vented by a hole say ¾ inch diameter through each shoulder to drain off any water that may collect in the interior of the roll during vulcanization. These holes should be opposite so when one is up, the other will be down and the slope of the holes should be so as to drain off the water from the interior.

The surface of the iron where the rubber is to go should be free from blow holes or porous places and should be rough turned with a feed of about 14 threads per inch. A perfect thread such as is used on a screw is not needed. The object is to bring up a new clean surface and a threaded surface increases the area of bond, between the rubber and the iron and of course makes a stronger union. The body should be cast in balance and not cast out of balance, and then balanced by adding weight to one side because walls of uneven thickness allow uneven distribution of heat of vulcanization.

If the body is thus prepared by the customer it should be wrapped with paper to keep the surface clean from oil, rust, etc. No oil should be used in turning the surface and all traces of oil grease and oily finger marks should be carefully avoided as they are one of the causes of blisters in rubber coverings.

Rubber does not adhere to brass as well as it does to iron, hence when it is desired to replace a bronze covering with rubber the bronze is first removed and its junk value will usually pay a good part of the cost of the rubber covering.

The iron body is given a coat of rubber cement and allowed to dry. A thin layer of rubber, compounded to become hard when vulcanized, which has previously been run out into a sheet in the calender is now applied to the roll. This requires great skill and experience for it is rolled down on the iron body somewhat as a paper hanger rolls down his wall paper and if any bubbles of air remain under the rubber or if the laps of the sheet are not perfectly united a defective roll will result. On top of this thin sheet about ⅛ inch thick other sheets of rubber compounded to give the desired consistency are applied, with the same care as the first one on top of the other. Thus the covering is built up much as a tree grows with concentric layers. When the required thickness of rubber compound is applied the roll is tightly wrapped with wet bandages of cotton duck and run into a boiler or vulcanizer. The steam is turned on until the required temperature is obtained and kept on for the proper period. As a rule it takes about 12 to 15 hours at a temperature of 260 to 280 degrees F. to vulcanize a paper mill press roll. Vulcanization is like baking with one marked difference. The cook wants the cake to be light, that is full of small holes or blisters. If a rubber roll has any blisters it is defective. Scientific controlling and recording instruments are used to govern and record the temperature to check the operation of the vulcanizer. After the cure is completed the door is opened and the roll run out to cool after which the cotton wrappings are removed.

The roll is then completed by grinding the rubber in a roll grinder such as many paper mills have. A few years ago a covering was considered good if the rubber was well stuck to the iron and was of about the hardness desired as judged by pushing the point of a pencil or a key into it, but today a covering is not considered perfect unless it is of absolutely uniform density from end to end and also around the circumference. Not only must it be of the right density as measured with a Pusey & Jones plastometer but what is of the utmost importance it must have maximum resilience that is, be snappy and have good "come back." Today up-to-date roll users distinguish between a slow soft rubber and a snappy resilient one. This important distinction is well brought out by likening the slow soft covering to the surface of a bog. It is soft and yields under a foot and the surface will regain its form when the step is removed while the resilient covering is like a spring bed. It yields when it is pressed but it springs back quickly when the pressure is removed. On a fast running paper machine, after a part of the rubber surface has passed under the nip it needs to spring back into shape very rapidly if it is to be ready when the same place comes again under the nip.

The plastometer is familiar to many of you. It measures the distance, a small metal ball penetrates into the rubber under a given weight. It measures softness or plasticity and does not measure resiliency or springiness. Of two rolls that give the same plastometer reading one may be much more

resilient than the other. The plastometer is a valuable instrument and much used.

Considering that rubber is a vegetable material and that injury to the quality of the covering may be done by lack of skill at any point of the process it is remarkable how close to the plastometer reading specified it is possible to come. For example, it is usually possible to come with three to five points nine times out of ten. How accurate this is may be realized when it is noted that a variation of 1/1000" in the penetration of the ⅛" ball means 2½ degrees on the plastometer. Having a perfect roller it is necessary to grind it perfectly. The Farrell Roll Grinder is the machine usually employed and with it a skilled man can put a perfectly circular crown on a roll of any desired amount.

How to Care for Rubber Rolls

How to care for rubber rolls and the diseases they may contract should be of interest. Darkness, dampness and a cool temperature preserve rubber; sunlight, dryness and heat deteriorate rubber. A good place to keep spare rolls is in a dark damp mill basement, the journals being greased to prevent rust and the rolls covered with wet burlap.

The bond of the rubber to the metal is not indestructible, but it is strong enough to withstand the pressure used if the pressure is uniformly distributed over the rubber surface. An excess pressure at one spot may start a very small loose place, which will gradually spread until the covering is liable to catch in the nip and burst with a report like that of a pistol. When washing felts the weights should be removed from both ends to prevent local excess pressure.

Journals should be kept cool. A very hot journal may heat up the end of the roll and weaken the bond of the hard rubber and iron right at the end.

Common Roll Diseases

The most common roll disease noticed in paper mills is "Wash Boarding." A small wave motion rolls up before the nip and if the consistency of the rubber is too soft or the covering lacks resiliency the surface of the rubber under the constant stretching takes a permanent set and the surface becomes too long and has to roll up in ridges to accommodate itself. This disease by re-vulcanization may often be cured provided the compound was not defective. Checking is the next disease. Fine cracks parallel to the axis of the roll appear. They open like a multitude of small pincers as they pass under the nip and closing pull the nap off the surface of the felt. This is a bad disease and is incurable. Its cause like that of wash-boarding is due to stretching of the surface of the rubber due to the wave motion that rolls up before the nip.

In this case, the fiber of the rubber breaks and cracks. The cause may be over vulcanization or oxidation due to old age or improper keeping.

Sometimes we are asked whether the consistency of a covering can be changed. Medium press roller coverings can usually be made firmer, say about 5 to 8 points by re-vulcanization. The softer the covering the less it can be hardened. If as soft as a top cylinder coucher it can't be hardened and no covering can be softened. Can new rubber be vulcanized to old? In the case of press rolls this is possible but not practicable. It is a good deal like baking some more dough on the end of a loaf of bread. It can be done but it spoils the original loaf.

Crowning of Rolls

The crowning of rolls was mentioned some time back. As every paper maker knows this is an important subject. The roll maker is often asked what crown he recommends for a given roll. If rolls were not crowned the paper would be wet in the center. Most people suppose that this would be caused by the springing, i. e., the deflection of the roll and that the crowning of the rubber roll is simply to offset this deflection. Now this reasoning is partly right but not wholly. The rolls are crowned, to be sure, in order to have the paper come through the machine uniformly dried but the tendency of uniformity of dryness is not entirely due to the deflection of the rolls. It is partly due to uniform drying tendency of other parts of the machine so that the crowning of rolls is required to correct this tendency as well as offset the spring of the rolls. As an example of unequal drying tendency of certain parts of the machine the drying cylinders themselves should be mentioned, for it has been found that if the paper should enter the dryers uniformly wet it will not come through uniformly dry. This tendency has got to be corrected either by more pressure being applied to one end of the press rolls more than the other, or by varying the crown of the rubber, and the latter is of course the proper way, for press rolls should have uniform pressure on both ends.

We have made much study of the theoretical crown a roll should have, simply to offset its own deflection and this crown naturally varies greatly. For a roll of a given length the crown varies according to the diameter of the roll, the thickness of the walls of the iron body and the density of the roll.

The rubber press roll is usually used in connection with a wood, metal or stone roll, which has a straight face, the crown required being usually put on the rubber. The harder the rubber the less the crown and the more important it is that the two rolls shall be perfectly ground, and that the rubber roll shall be of perfectly uniform density. If such rolls are at all mismated perfect results cannot be obtained. Small defects in such a pair of rolls make trouble, which would not be so noticeable if the rubber was of a medium soft density.

To sum up, we can prescribe the proper crown for a roll under given conditions which would be considered the average crown and this crown would probably be approximately correct, but the only way to find out the proper crown for particular conditions is by "trial and error" and this each paper mill superintendent does.

Shipping Rubber Rolls

It may be well to call your attention to the fact that great care should be taken in boxing rubber rolls for shipment. Speaking about it now is like locking the stable door after the horse has been stolen. Large numbers of rolls reach the rubber factory with the boxes smashed, due partly to their not being strong enough and partly to the rough usage of the railroad traffic. It is a great advantage to the paper mills to be able to get a low freight rate on these rolls. Formerly they took third class rating. The railroads have had to pay for so many rubber roll coverings that were injured that they now only allow the rolls to come third class with the old coverings on. When new or valuable coverings are on they have to take second class rate, which is higher. Even the third class rate is high enough today and increased freight rates partially account for the tendency of the paper mills to have thicker coverings put on so that rolls do not have to be sent back so often.

Speaking of thickness of rubber coverings it should be mentioned that another reason why thicker coverings are used today is that due to improvements in the process roll makers do not have to employ such a large part of the covering, simply to hold the balance on to the iron body and they can devote a much greater thickness to the cushion so that coverings can be made so that they can be ground down very thin and still show nearly the same density as when new.

WHY?*

By Benjamin M. Bishop, of the Gardner, Harvey Paper Co., Middletown, Ohio.

The title of this paper is "Why." And why I was unfortunate enough to have President Boyce pick on me to tell you something about boxboard I can't say, but since he has, I wish to preface anything I have to tell you by disclaiming the idea that I have anything to tell you that you do not already know; but I will try to give you some boxboard as we make it at the Gardner-Harvey Paper Company.

Nothing Equal to Rotary System

What I mean by that is our own particular way and system. Of course, everyone has his own way and system, which he naturally thinks is the best. Personally, my experience is that there is nothing equal to the rotary system for a board mill.

Right here, let me cite a little incident that happened to me the other day. We were running on Manilla lined chip, but just previous to this we had a small accident in the rotary room in the way of a breakdown, which caused me to have about forty per cent of my filler stock furnished on the floor, meaning in the beaters direct. Well, about this time, we had a change coming on the machine to Manilla lined chip, news back (and let me tell you they come pretty often right now, too). Anyway, I was going down the machine room and the machine tender stopped me and said, "Say, Bishop, can't you have that news back furnished on the floor for this order?" Now, why did he ask me that, considering, mind you, we were already furnishing forty per cent of our filler on the floor? I'll tell you why.

He knew that as soon as the news from the rotary struck his cylinder, he would have to begin chasing blows. (Why?) Yes, *why* was that? Because, the rotary system defiberates the old papers, separating the fibers so thoroughly that when you put it on the molds, you have a perfectly formed sheet, closing up tight, hard and smooth.

Now in this particular case, supposing he has a well separated stock made from news, closed up well on the back, and his filler as I told you, forty per cent mixed papers furnished on the floor or in the beaters. Then forty per cent of the filler stuff going to the machine had all the dirt, sticks, iron, strings, bones and any other foreign matter go past the jordans and screens (not counting the terrible wear on the beaters and the tearing up of the jordans from so much iron and stones passing through them). Then when it gets past there, you are bound to get some of it on your molds. (What is the result?) If there are pieces of paper, iron, slivers of wood, sand and such things coming up on your filler molds, you are bound to make small pockets to hold air, so when the next play comes to it, if the stock is closed up good and tight as it should be for a smooth sheet, why you will have blows, and the coarser and dirtier the filler, the more trouble of that kind you will have.

And it also proves true of test board. If your stock is of a different formation due to not being thoroughly defiberized, you will have a different test every six inches across the machine, which will not be the case if the fibers are well separated and the machine in the proper condition.

I think you can readily see why the machine tender wanted me to furnish the news back on the floor, so he would have a coarse open back to get rid of the air brought up by the dirt and coarse stuff on his filler molds, even though he knew he would not have as hard and smooth a sheet as he had with the rotary stock.

Getting Rid of Foreign Matter

Now, our particular way out there to get rid of the foreign matter in the mixed papers is this: We take our stock after it has been cooked a certain length of time, elevate it to a large mixing and settling tank, where it is kept constantly agitated by the use of its own water. This agitation is so arranged that the stuff itself never gets to the bottom of the tank, nothing but the heavy matter such as iron, tin cans, stones, bones, dirt, etc., and the float such as wood, cork, rags, strings, etc., are caught at the top and taken away.

Then the stock has to travel over settling compartments through string catchers and other devices that take care of every foreign particle down to a pin point.

We are so arranged that when the stock gets to the screens, every disturbing element is out except what papers might not have cooked entirely. Then it travels from the screens to the wet machine, between which are devices to retain any small particles which might be left in the water or stock. After leaving the wet machine it is kept in constant agitation by a series of rotary pumps. From there, it is put through the jordans and then on the machine where it gives better satisfaction as to finish, test, etc., over the regular beater furnishing way.

Get a Higher Finish

And one very important thing is, we get a higher finish than we did when furnishing the stock in the beaters, which we claim is due to the close formation of our sheet by getting the papers thoroughly defiberized.

One more word in regard to our rotary system or any other mechanical device, for that matter, that will *positively* remove all beater and jordan destroying elements. Don't misunderstand me now and think I am a selling agent for the Tom Harvey Rotary System, for I am not. "It's just a fellow feeling for a fellow being." But, I am positive if an installation of this kind were installed in a container board mill, where it is most essential to have the beater rolls, bed plates and jordans at their very highest point of efficiency at all times, the result would be a revelation both as to production and quality. Also the saving of the enormous monthly repair bills due to repairing beaters and jordans. All three items spell money and satisfaction for the company and management.

As to the machine, I don't think there is any use of saying anything about that. Regardless of its condition, it has to be governed according to whatever kind of stuff we give it and on that entirely depends the result, quality, etc.

But in regard to all departments of a board mill, *especially* if we took a little more pride in the cleanliness and sanitation of our mills, we would be able to demand, and get a better class of labor by keeping the mills clean and wholesome. It would also reduce the cost of insurance for the company and when we reduce the cost of something for them, we also increase our value to them.

Co-operation Essential

It is a matter of congratulation that we have this body of board superintendents here with the privilege of each other's confidence. We must realize that co-operation of the mill superintendents is very essential for the good of our respective firms, as the superintendent is a connecting link between employee as a producer and method improver. And this is the time to cultivate a friendly relation between superintendent and employee, as a sense of personal interest and sympathy will go far to help satisfy and hold our help. Superintendents are in a field of their own, a field of practical study and application of personal experience in the actual daily process of the mill, and no one can achieve greater efficiency and economy than they.

*Read at the Spring Convention of the American Pulp and Paper Mill Superintendents' Association, Waldorf-Astoria, New York, June 3-5, 1921.

PRESSROOM REQUIREMENTS*

By S. M. Williams of the New York World.

"Good paper mill superintendents are born, not made," remarked a manufacturer to me recently. Therefore, I, who unfortunately am not one of this heavenly-inspired class, would hesitate to enter your circle were it not for the fact that newspaper men also are supposed to be products of predestination rather than of development. Editors are born, not made, is an old-time maxim; or at least all worth-while editors must have come from the printer's case well smeared with ink. I cannot agree entirely with the statement of my manufacturer friend, even though it was Harry P. Gould, of Donnacona, who said it. Genius, however brilliant it may be, marches an erratic course without the help of education and training.

In the newspaper profession we are establishing schools of journalism to train promising reporters who may not have sufficient pre-natal inoculation of editorial germs. Nature may fail some day to furnish a sufficient ready-made supply to meet the demand.

I know that all of you gentlemen possessed at birth that microbe "superintenditis," but I am strongly impressed with the very great benefits all may derive from the educational program of your association. It is developing a broader, better class of paper makers, and so doing will help materially your fellow workers, the newspaper makers.

It is this mutual relationship that I venture to discuss with you. I must confine myself, however, to news print and its uses, for that is my special line. Therefore I beg the indulgence of that select corps of superintendents who make higher grades of paper, so smooth to the touch and so beautiful to look upon.

Whatever may have been the business antagonisms of the past, common interest and common sense call for a cordiale entente between pressroom and paper mill. They are interdependent, not independent. The supreme test of every mill superintendent's product is in the pressroom. Likewise the record of a pressroom superintendent is affected to a very considerable degree by the paper sent him from the mill. I look forward to the day when we may have joint meetings of the practical makers and the practical users of news print to discuss their respective needs and troubles. When men once arrive at mutual understanding of each other's problems the road to progress is smoothed.

The price per pound that a publisher pays for paper too often does not represent the real cost. His paper expenses are not f. o. b. shipping point, but are based on the number of printed copies that come from the press. Between the finishing room of the mill and the circulation department of the newspaper there are many slips that mean profit or loss to both manufacturer and publisher.

It is human nature to shift the blame on the other fellow; passing the buck is the popular phrase. Pressmen charge most of their breaks and delays to bad paper. Mill men retaliate with criticisms of pressroom methods. Usually details and specifications are lacking. Long range firing like this is apt to be aimless and ineffective. My observations, with the advantage of being able to check up in both mills and pressroom of the New York *World*, lead to the conclusion that there are rights and wrongs in both camps, with a very wide no man's land, namely, transportation, lying between them.

Lack of Attention to Details

I have very little fault to find with news print produced by leading domestic mills so far as quality of the paper itself is concerned. In formation of the sheet, in finish and in tensile strength, high standards are well maintained. That responsibility is entirely in your hands. The principal flaws revealed in pressrooms are not intrinsic but contributory, usually caused by carelessness and lack of proper attention to details after the sheet has passed through the machine. Up to this point science, skill and machinery have played the principal parts in making paper, but once past the calender stack it falls into the hands of that most uncertain factor of all operations—the human equation—and troubles begin.

The finest roll of paper that a foreordained, born to order superintendent can produce must run the gauntlet of more or less careless, indifferent bunglers lined up to slam bang the paper all the way from machine room to pressroom, ten pounds of waste to every bump, piling up costs on the publisher and criticism on the maker. Everybody passes the buck, and generally gets away with it because there is a gulf between paper mill and newspaper office that is not yet bridged with cordial co-operation. In the New York *World* establishment we are at last bringing the two ends of the line together and checking up on causes and effects. Some of our observations may be worth while noting; others doubtless have already come within scope of your practical experience.

Practically all waste is due to two causes, namely, external damage to rolls and internal flaws in the paper. The first produces white strip waste, that is, the layers of bruised paper which must be stripped off the rolls before they are put in the press, and also press interruptions. The second results in breaks in the press and piles up quantities of crumpled waste, besides the spoiled and incomplete printed copies that follow on every interruption.

Strip waste is caused principally by careless paper handling. Press waste is the product of poor paper making and poor press operation; I won't say which must share the larger responsibility. There are good paper makers and poor pressmen, and vice versa.

Principal Cause of Damage

I have already remarked that the intrinsic quality of the sheet of standard American news print is very good, so good that I am leaving out of these generalizations faults charged to lack of tensile strength, brittleness or other kinds of structural weakness. There is enough poor quality paper, but the percentage that lacks strength enough to run through the press is small compared with other defects. Practically 90 per cent of the damage and waste in news print is due to the following: (1) Bad splices; (2) poor winding; (3) improper wrapping; (4) careless loading; (5) rough unloading and trucking; (6) pressroom operations.

In this list we have four charges against the mill, one against transportation and one against the newspaper. Although the mill has to stand the larger number of specific counts, yet I think that the gross waste chargeable against transportation is much more than any single or double mill fault.

Bad Splicing and Poor Winding

Two indictments that I am obliged to sustain against many respectable paper mills are based on bad splices and poor winding.

It is painful to see how carelessly splicing often is done. Some of the common deficiencies are: Paster tape overlapping edge of the sheet with gummed side sticking fast; part

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of the tape turned gummed side up, catching the next layer of paper; overlapping salvage not trimmed off; sheet crumpled at the splice; paper burned with too hot iron.

Nothing seems to irritate the crew of a printing press more than a bad splice. The warning red flag in a roll to slow down is aggravating enough, even if the sheet does go through all right. But let a break occur from a sticky plaster, then all paper makers from superintendent down are consigned to the lowest depths of pressroom purgatory.

We know that breaks will occur and that splices are necessary. Only ceaseless vigilance by superintendents will produce the nearly perfect splice until we get a machine to do it automatically and eliminate the uncertain manual operation.

Because I am not a paper maker I can make sweeping offhand statements about your business when experts wisely would refrain. Here is one straight out. Judging by the product, good windermen are scarce in paper mills. It is a hard thing to say, but the finest winding I ever saw—smooth, even, true, firm and solid—was on a roll of German paper. It was rotten bad paper in quality, but the winding was beautiful. The 73-inch roll, 32 inches diameter, weighed 1,700 pounds as compared with an American average of less than 1,400 pounds.

Will somebody please tell me why it is necessary to wind ribbons in a roll? Certainly the pressroom does not want them.

Is there any good reason why folds and flaps and torn edges should be wound in They are sure to cause pressroom interruptions and profanity.

What kind of workmanship is it that winds one end of a roll loosely and the other too tightly, assuming of course that the machine tender has turned out an even sheet. Such rolls wobble in unwinding like a lame duck.

Who is it that winds one roll so tightly that it splits the edges and the next one so softly that it collapses like a punctured tire? These mean many pounds of waste.

I beg of you superintendents to watch the winding and pick out windermen with straight line eyes and calliper hands.

Damage Around the Ends

Ninety-five per cent of the external damage done to a roll of paper is at the edges around the ends. I don't care much whether the body of the roll has any wrapper around it so long as the ends are well protected. A cut or a dent on the end may spoil fifty or a hundred laps while a similar perforation on the side would not go through ten laps. If somebody devised a practical protector for roll ends and could charge merely a small percentage royalty on the saving he would be rich in a year.

It is largely guessing, but I venture another broad assertion that external damage to ends of rolls amounts to one per cent of the total weight. Our annual United States and Canadian production of rolls is two million tons. Say damaged ends cause only one-half of one per cent waste. There you have ten thousand tons of waste, which at current prices means a million dollars. Some damage bill, is it not?

Mere weight of wrapping paper is not adequate protection. How and where you put it is the main thing. As the weight of wrapper is included at news print prices in the publishers' bill, he naturally is much interested in that. He wants quality more than quantity. Putting on the finest and costliest grade of wrapping paper is not the answer. Soft old bogus may be better than a sulphite grade. The protection most needed is a tough but spongy wrapper that will act as buffer or bumper to guard the end and edges of the roll.

A good standard of wrapping adopted by a number of high class mills is predicated on a roll having an indicated top and bottom and that whenever stood up it must always be on the same end. The body has a single thickness of wrapper; the top has three bands and the bottom five bands, plus the overlapping of the body wrapper, well crimped, and the customary circular end piece, which should be securely pasted on. If the end piece comes off, the whole end is liable to be loosened and exposed through handling.

As a rule domestic mills use only paper wrappers, although some Pacific Coast rolls we received two years ago were barrelled with wooden staves. However, this may have been originally packed for export. All Scandinavian and German paper now coming to the United States is in wooden barrels, but many of the foreign manufacturers at first made the mistake of giving more attention to protecting the sides than the ends of rolls. Early importations had no end headings at all and the wooden side staves did more damage than good through slipping.

The finest piece of protection I have seen was on a recent consignment of paper from Holland. I did not know the Dutch made enough paper for their own use, let alone for export, until this lot came to New York. It was encased in wooden barrels, with staves an inch longer than the roll, with circular wooden heads, double thickness, nailed snugly in the ends. The nails were driven so carefully through the side staves that they penerated between the double heads, thus preventing their touching the paper. In addition there were criss-crossed metal straps over the ends.

Wooden barrelling is too costly for domestic use, both on account of expense and of freight, besides being unnecessary, provided proper care is taken with paper wrappers.

Precaution in Loading

Another precaution needed at our mills is in the loading. Car inspection is highly important. Leaky roofs, openings in floors, projecting bolt heads and nails and careless door battening are constant sources of damage to paper. During the war time car shortage, mills often were obliged to take whatever cars they could get. I have seen paper shipped in steel coal cars, which was a great risk. Now, however, no bad order car should be loaded. Turn every one back to the railroad company. Likewise reject automobile cars. They have double doors that cannot be made to close snugly. Put down wrapping paper if car floors are not perfectly sound and tight. Pad stanchions at all doors. Be sure that rolls are packed close and tight. The key roll at each door should be blocked with a 4 x 4 chock nailed to the floor so that there will be no chance for shifting of cargo. If you think a 4 x 4 piece requires too long nails, use two-inch blocks nailed over each other. Rolls are liable to jump over anything less than four inches in height.

The old-fashioned hand truck, with its sharp, iron toe blade used at railroad stations, and sometimes in mills, is another enemy of paper. Short rolls rest wholly within the truck, but frequently long rolls are allowed to overlap on the iron blade for better balance. Dents and disturbing pressure result from this. If you use hand trucks, cover the toe blade with a wooden shoe.

What May Happen in Transit

When the mill force has done well its wrapping and loading, its direct responsibility for what happens afterwards ceases, since sailing f. o. b. shipping point has supplanted the former sidewalk delivery system. A great deal can and does happen to paper in transit, more of the damages being done at terminals than en route. To a freight handler, a roll of paper is not a great, big baby to be coddled tenderly, but a bulky, awkward nuisance to be treated like the joke book baggage smasher deals with a trunk.

Invariably it is the end of the roll, and particularly the

tender susceptible edge, that gets the worst of it—banged, bounced and bumped at every turn. The ideal handling would be to have the roll always on its side, never ended up. We experimented recently with paper from a mill near enough to New York to permit of automobile transportation. At no time in its existence from paper making machine to printing press were the rolls stood on end.

On the Printing Press

Now, we come to the final test of all paper—the printing press wherein is revealed its strength or weakness, its perfection or flaws. I am radical enough, or reckless if you prefer, to say that I care little for the customary tests to determine paper quality. The eye for appearance, the ink for finish and the press record for strength compose the real jury, no matter what instruments or analysis may show.

The so-called pop test is good as far as it goes, but it does not cover one-tenth of the possible flaws in a sheet. I have seen paper stand very high pop test and give great trouble in the press room; and sometimes exactly opposite conditions may prevail. The press room waste report tells the true story whether paper is good or bad. What newspapers want is a sound, undamaged roll, well wound, cleanly spliced, free from cracks, smoothly calendered and of even quality. With such paper there will be a minimum of waste, regardless of whether the pop test is high or low.

When paper tears apart as it unwinds and before it passes under the press cylinders, we call it a break. When the sheet clogs, jams or parts in the press, making a mess of waste in the machinery, it is a choke. Pressmen charge most of their breaks to splits or cracks in the edge of the sheet; to sticky plasters and wobbly rolls.

Can anyone tell me what causes the small, often invisible cracks? Doubtless there are many causes. I have a theory that uneven winding plus rough handling is an important factor. When a roll is tipped up or dropped so that the weight falls on the edge, lateral strain results. If the winding is not perfect, the strain is not evenly distributed and presses hardest somewhere against the edge of the sheet, either weakening to an invisible crack, or bursting it apart for several inches. Doubtless you gentlemen know of other certain or possible causes, but the fact remains that the crack is one of the most frequent flaws found in paper. I do not credit every press room report charging cracks in papers an indictment against either mill or transportation. There is such a thing as uneven tension in presses and uncertain human equations in press crews.

The press room almost always lays the blame for interruptions of every kind to some flaw in the paper. It is human nature to pass the buck and to charge the responsibility to some other fellow. External damage to rolls can be detected, but the tangible evidence of flaws wound in the roll is generally lost in the crumpled mass of press waste.

It is not fair to hold the mill superintendent for every failure of the fragile sheet to run the gauntlet of strains and rough usage endured on the long road from spruce tree to the printed newspaper. I marvel that your product comes through so well as it does. But by more watchful care and close cooperation all along the line, each doing his part, we can hope to reduce the tremendous bill for waste newsprint that averages from three to five per cent of the total production, amounting at present prices from six million to ten million dollars annually.

THE PERMANENCY OF THE PAPER INDUSTRY*

By Dr. Hugh P. Baker, Secretary, American Paper and Pulp Association

In any question as to the permanency of an industry there are certain definite fundamental factors which must be given consideration. The factor of *market* would be a first consideration because no industry would come into existence or continue if there is not a fairly satisfactory market for the product of that industry. The second most important factor is that of raw material. A permanent supply of raw material is absolutely fundamental to the permanency of any industry. If we have present in a given region the two factors of market and of raw material, the important factors of finance, of labor and management will take care of themselves. The mere presence of these two fundamental factors has made America the greatest industrial nation of the earth.

Paper is of such common every day use in the more civilized portions of the world that the factor of a market is not of determining significance, in this industry. It is, of course, always a vital consideration, and especially under the adverse business conditions of today. Looking at the question of permanency of the paper industry in a broad way and over a period of a decade or two it is safe to say that the most vital consideration in making our industry a permanent one is the solving of the problem of raw materials for the industry.

Problem of Permanent Supply of Raw Materials Has Been Neglected by the Industry

In trying to analyze the trade associations serving the paper industry, it has been exceedingly interesting to find that the two questions which in a way are most vital to the manufacturer of paper cannot be considered because of legal objections, or have not been considered because of economic and business reasons. The question of prices of paper we are forbidden to discuss in our associations, and if there be one thing a new trade association secretary learns quickly it is that he must keep within the law himself and do all that he can to keep his trade associations within the law. It is more difficult to appreciate just why so little attention has been paid to that other question which looms so large in the future of the paper industry, that is, the question of a permanent supply of wood for our mills. True, we have grown up as a nation through the past century or two with the idea that our forests were limitless and that somehow or other there would continue to be a flow of wood from the forests to the mills or to other industries. With wood reaching the price of a year ago and with the very certain knowledge that we are over-cutting our forests annually and that in the next ten or twenty years we are going to see wood more expensive than it was last year, it is of tremendous concern that we pay a good deal of attention in our various associations, and in the industry at large, to this question of wood for the future. The wood pile is the foundation of the paper industry. Upon the permanency of that wood pile depends the permanency of the paper industry in America.

It would be stating a truism to tell you that wood has become of increasing importance in the manufacture of paper in this country in the past 25 years. Today less than 2 per cent of the paper manufactured in America is made wholly from pure rag stock. In other words, 98 per cent of the paper manufactured in America is made wholly or in part from wood. In an old and important fine paper center in Massachusetts, which, under the conditions of a year ago, was producing five or six hundred tons of paper daily, there was being used a great quantity of rags, it is true, but the daily consumption of wood pulp in that fine paper

*Read at Spring convention of the American Pulp and Paper Mill Superintendents' Association. Waldorf-Astoria, June 3-5, 1921.

center was around 400 tons daily. It is therefore not only the concern of the manufacturer of newsprint and wrapping paper that the question of wood supply be studied and solved if possible by the paper industry, but it concerns deeply every manufacturer of paper.

Our Forests and Our Industry

America was blessed originally with the finest forest of any of the continents. The forest, like the soil, is here for our use, and we have used and misused the forest until today we have left but two-fifths of the original timber of the United States. Use has increased to such an extent that we are now consuming the remaining two-fifths of the original forest four times as fast as wood is growing in this original forest.

Thoughtlessly we have used up the forests immediately surrounding the manufacturing centers of the East until today we are paying a very heavy penalty to the forest-producing areas of Canada and of our own West, bringing about a condition that is not at all a satisfactory one from a national standpoint. In other words, our different industries and our population are centered in the East where the forests have in many instances disappeared, and yet where they are needed, and the forest areas from which we are now drawing our timber for this industry and others occur in sections where population is scattered and industries are limited.

The original virgin forests of this country covered 822,000,000 acres, but our use has been such that we have left but one-sixth of this area. Today all classes of forest land, including forests partly cut and land burned and cut over, total something over 460,000,000 acres. Beside this we have over 80,000,000 acres which have been so badly cut and burned as to be an unproductive waste. Less than 5 per cent of the virgin forests of New England remain. The total cut of lumber in New York is not just equal to the amount of lumber being used in the State for packing cases or boxes. In other words, New York is manufacturing 30 board feet per capita, though its requirements are nearly 300 board feet per capita. Down in Pennsylvania, the Pittsburgh section alone uses more timber than the annual cut of timber in Pennsylvania. These statements as to the way in which our forests have been used paint very clearly the course of action which such a wood-using industry as the paper industry must take in the next ten to fifty years if it will have wood for the mills. This industry must use every possible effort to conserve the forests which are still fairly accessible to the country, and must work increasingly with other industries, and alone, to bring about constructive legislation which will make it possible to conserve our forests and then to use them properly and make them permanent sources of raw material for the manufacture of paper.

The depletion of our forests has not affected the amount of saw timber only. Since 1909 this country has ceased to be self-supporting in newsprint paper and now imports over 20 per cent of the pulp needed, and nearly 50 per cent of the newsprint required by the country.

Statistics as to the ownership of the forests of this country are exceedingly interesting, and this matter of ownership must be considered very fully in plans for future forest development. About four-fifths of the timber standing in the country is privately owned. Over one-half of this privately owned uncut timber is in the hands of about 250 owners, and the other half is distributed widely among small owners in the different states. There are 24,000 holdings of timber of less than one billion feet in Washington and Oregon alone. It is estimated that the far wood lots East of the Mississippi contain more than 150,000,000 acres. It is safe to say that these wood lots contain two-fifths of the standing timber in the eastern half of the United States.

Use and Abuse of Our Forests

There has been both use and abuse of the forests of this country since our nation was established. It should be remembered at all times that the forests are here for our own use but not for abuse. Because our forests were so tremendous in area, and in quantity, we developed very clearly the idea that they were inexhaustible and that waste was necessary. This idea of indifference has come down to the present day and is one of the most difficult things to overcome in securing constructive legislation by the States and the Nation.

Fire has destroyed more of the forests in this country since the white man came than has been used by the people. Fires have been so continuous down through the years that many of our people have come to the conclusion that fires are a necessary evil and possibly somehow we cannot prevent them. It is estimated that fires and destructive logging are costing this country $25,000,000 a year. Fires sweep annually over eight to ten million acres of cut-over land, preventing natural reproduction of the forests and possibly destroying the soil to such an extent that 100 years or more may pass before there can be forest growth of any kind covering the land again. The destruction of the standing tree and the forest is in a sense the least of the injuries resulting from fire. The forest is a renewable resource and the years to come will see better forests on our forest land than grew there as virgin forests.

When the fire destroys the young growth and causes the destruction of the soil, then such damage has been done as may take centuries to overcome.

Prevention of Forest Fires

Seventy-five per cent of the forestry problems today in this country is prevention of forest fires. It is estimated that 175,000,000 acres of forests are unprotected today. Even in this great State of New York, which has fairly effective fire laws for State owned lands anyway, it is estimated that during the past Spring the loss by forest fire to the State was over a million dollars.

Prevention of waste in the forest and the growing effort to extend this prevention of waste to the practice of lumbering, construction work, and wherever wood may be used, means the saving of the forest and the putting off of the time when our virgin forests will be exhausted.

The United States the Greatest Forest Country of the World

Not only was the United States covered with almost a solid block of forest, outside the Plains country, when white men first settled here, but even with the development of the nation down to this year of 1921 we are still a great forest country because of the hundreds of millions of acres of potential forest land alone which is better suited to forests than to any other growth. With two-thirds of New England classed as forest land, with eight or ten million of acres out of thirty in New York real forest land, with one-half of Pennsylvania a forest country, and so on through very many of the States, it can be seen that the problem of making this country a real forest country is not a difficult one, except insofar as we need to convert the users of wood and people generally to the idea that something must be done and done promptly with these empires of forest lands to provide for permanent supplies of wood for our industries.

The American Paper and Pulp Association stands out among the wood-using industries of this country in the positive, forward-looking position which it has taken in this matter of maintaining and increasing the productiveness of the forest lands of this nation. In the years to come the Association will look with pride to the position which it is taking at this time. There has been a little criticism that possibly too much attention is being paid by the Association to the question of raw materials. Yet no man who thinks over this question of the factors entering into the permanency of the paper industry can fail to conclude that a permanent wood pile at the pulp mill is absolutely essential. And back of the wood pile must be abundant and permanent forests.

THEM DAMNED CHEMISTS AND ENGINEERS*

By A. D. Wood of the Champion Fibre Co., Canton, N. C.

First impressions are said to be lasting ones, and when it was suggested that I might present a paper to the Superintendents' Association relative to co-operation between the operative and technical forces in the pulp and paper mill, my mind recalled its first impression of the technical men.

This was about 1890, and sulphite pulp manufacture, a comparatively new industry in this country, had a poor reputation, its best known product at that time being pungent odors.

We were standing at the base of the de-oxidized bronze digesters, and as the boss removed the sponge from his nose (sponges saturated with ammonia were much in vogue at that time) he said, "If they'd keep them damn chemists and engineers out o' here, we might get something done."

Now, I was only a kid, new in the mill life, and I didn't know anything about chemists and engineers until after he classified them, but it seemed to be the unanimous verdict of the crew that Old Joe was right. No one present attempted any rebuttal of his statement. It was evident that they were of a class which deserved condemnation.

I am taking it for granted that there are many here today, who, like myself, are classed as "ol' timers." Probably a large number of us "quituated" from school instead of being graduated. A lot of us didn't wait for any commencement exercises, we just commenced when we got ready. They wouldn't let us run a school, so we thought we'd try a pulp or paper mill.

And maybe it wasn't all our own choice. Perhaps we were of the legion of youngsters who were absolutely compelled to quit school and go to work to help support mother and the folks. At any rate, we made a startling change in courses and teachers.

During our first few weeks in the mill, we made rapid progress. We learned to chew black plug tobacco. We conquered the art of coloring a short-stemmed Henry Clay pipe. We added to our vocabulary (thanks to the third fireman in the boiler house, who used to sail the lakes). He taught us Boiler House Rhetoric. During the first few months of service, the newest kid on the job used to be the errand boy. We often went to the blacksmith shop, the carpenter shop, the pipefitting or to the machine shop, with minor repair jobs, and while we were waiting we were always learning how things are done. Everywhere we went we heard shop-talk and often the fellow who indulged in the most talking was guilty of the least straight thinking. He wasn't the class of man you'd pick out today to act the part of private tutor to your boy. Taking it all in all, it was, at best, a one-sided education. Our self-appointed teachers were often dominated by prejudice, and it was from them that we absorbed the idea that the technical man in the mill was a kind of "fly-cop," a policeman working on a piece rate basis, who made an extra dollar or two for himself everytime he could get a fellow in trouble.

As the years went by, we were promoted from job to job and then we were thrown in direct contact with the technical man, the fellow with the "book-larnin'." Many of these men were foreigners, unaccustomed to American ways, others were home-grown, but they were not our kind of people. We felt that they felt above us. They didn't know us, we didn't know them, and they didn't invite us to get acquainted. Sometimes, they'd ask us to do things and sometimes we'd do them. Other times, they'd tell us to do things and you remember what happened.

Why They Failed to Get Together

Let me relate one or two experiences, illustrating the way we failed to get together. I was about twenty-one and a "boss" in the sulphite. A man who said he was a chemist had been sent out in the mill, and instructions were issued to our force to give him all necessary assistance in putting up some apparatus. His claim was that he could bleach sulphite pulp with waste sulphite liquor and we assembled the experimental equipment. He'd been on the job a week or two when one morning he came to our lead-burner with a cast iron flange and a leather strap and ordered him to solder them together. When he was told it couldn't be done, he lost his temper. Our lead-burner asked him what he was going to do with the flange and strap, thinking he might suggest a method of fastening the two materials together, which would answer the purpose, and he flew into a rage and said, "You have my orders and it makes no difference for what I want it." Along about that time, the sulphite mill crew, boss and all, lost interest in the man and his scheme.

Sometime later, I was visited one morning by a nice old chemist, who had been in the laboratory for years. He approached me with the question, "What do you know about differential calculus?" I told him I didn't know anything about it and asked if it was some kind of a breakfast food. He proceeded: "Well, Albert, the recording instruments which I have in mind for use in your department will indicate with absolute accuracy the most infinitesimal increment—". I can't remember the rest of his speech. It wasn't in the vocabulary of my esteemed instructor, the third fireman. Within an hour I was in the "lab" and he was out. A dictionary lay open on the table and I saw it was open at "calculus" and I read that it had to do with the doctrine of infinitesimals and I couldn't help feeling that he'd prepared my course in higher mathematics for me that morning and ran out and served it while it was hot. What was his motive in using that high-brow stuff on me? My only answer was that he wanted to impress me with his own importance and by own inferiority.

In this mill there was also an engineer and he pulled one way, the chemist the other and the mill man was the other corner of the triangle. The engineer has tipped me off more than once as follows: "They're in trouble in the paper mill, and they'll lay it to the sulphite. The chemist has woke up again; you'd better run out in the mill and change something; it don't make any difference what you change, as long as you do something different." Somehow that kind of "dope" didn't increase my respect for either of the two departments.

Another Instance

One other instance that happened when I was just a kid. I was at work in the wood room and a man who held the position of engineer came down to the wood room boss and told him to have me take a chipper knife and file three inches off the end of it. The wood room boss suggested taking it to the blacksmith and having it annealed, then to the machine shop to be cut off. The engineer answered him with all the dignity of a second lieutenant: "You have my orders, let the boy file it as it is." The boy went to work and with each stroke he had a rasping thought of that engineer.

I have cited these instances feeling that many of you have gone through similar experiences and that you have suffered the same reactions. Now let me tell you of another chemist. One morning the manager summoned me to his office and introduced me to a chemist whom he told me would be with us for a time. He said, "I want you fellows to get together and come in with your suggestions. There is always a chance for improvement. Thresh out the things you can agree upon and then we'll talk things over."

We not only worked together, but we went fishing together, we went to the races together and there we lost the idea that either of us knew anything about what was going to happen. It

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was before the days of the eighteenth amendment and we actually got—acquainted. Our environment in the early days had been so different that we found that we would interest each other. I found that I wanted to be able to think straight, like he did. There wasn't anything underhanded in anything he did. That is the type of technical men I have been meeting since.

Why This Man Was Welcomed

In preparing this paper for your consideration, I asked myself the questions: What was it that made me welcome this man to the mill? Why did I do everything within my power to further his work? Why did he always listen patiently to my side of the discussions which arose?

One of the correspondence schools, in a course which is termed, "Salesmanship," lays great stress upon the importance of securing "favorable attention," and in answering the above question, I firmly believe that the attitude of the "big boss" toward both of us, securing our "favorable attention" and arousing our interest in the job before us, had much to do with the successful co-operation which followed. He didn't tell the chemist to go down in the mill and "shadow" the "super." He displayed confidence in each of us. He showed us equal respect. It was the attitude of justice and fair play.

Right here, I would like to make a suggestion to the big boss himself, the manager of the whole works, the one who hires both the "super" and the technical man.

If he happens to be the head of a household, when he's off duty in the mill, I would suggest that he make a survey of his home and satisfy himself that it isn't really scientifically managed, at least that there is room for many improvements. Then I would recommend that without saying anything to his wife, who supervises the home, that he employ a few experts to come in and analyze the conditions as they exist, that he place a fuel expert in the kitchen and at the furnace, put a time study man on the trail of the cook and systematize the work of any other servants.

I am not taking the stand that he hasn't a perfect right to do all this and more, but let him try it for a week or two and see if he is inspired during his leisure to write poems about "Home, Sweet Home." He may learn, during the experiment, from the home-superintendent or the working force, something of the way the mill "super" and crew feel under the same conditions.

On the other hand, if he would have a little heart to heart talk with his wife, explaining to her that he's been thinking about improving the home by the installation of labor-saving equipment and the application of better methods, that an electric sewing machine, dishwasher, range, vacuum cleaner, etc., might prove good investments, and suggests bringing a man home with him to look things over, one who is recognized as an expert on these matters, who would confer with her and make his suggestions, the chances are that before he gets a block away from home the next morning, she'll be over at the house of a neighbor boasting about what a dear, thoughtful, considerate husband she had and how *we* are going to improve *our* home.

The expert who comes to work under conditions such as these will enjoy to the fullest, the co-operation of the operating department.

Change in Chemists and Engineers

Doubtless, some of you men here have seen, as I have, a change in the chemists and engineers. Perhaps you have changed yourself as I have. May be you have a son that is a technically trained man, as I have, and as you have watched his development you've been forced to admit that our modern schools and colleges are institutions which teach fair play. It may not be taught under that name, but it is the spirit of the organization, and my sympathy goes out to the young graduate who first enters the pulp mill as a chemist, to be thrown in contact with the pupils of the third fireman referred to in a previous paragraph. Said fireman was a thorough teacher along some lines, but you'll admit, with me, that he was a little lame in his ethics. It is at this time, during the first few days in the mill, that the technical man and the man on the job are apt to arrive at a complete misunderstanding.

I read a few days ago, an article relative to the work of the chemical engineer in the pulp mill, and the author, evidently himself a chemical engineer, was carrying a "first impression" of the operative force in the acid room of the sulphite mill. He relates how the only space available for a "lab" was in a room over the acid plant, and the chemist was there subjected to gas attacks, deliberately made upon him by the acid makers. This evidence of unfairness on the part of the working force in that particular room of that particular mill was evidently his introduction to the practical men of the mill. The spirit shown was something new to him. He had been brought up in a different atmosphere and he couldn't understand it. Very naturally he assumed that the working force was against him. He formed his opinion of the practical man just as I did of the chemists when Old Joe told me about them away back in my boyhood, and now he has written an article, the reading of which will probably lead some manager to believe that his working force is crooked and unfair to the experts he employs. I was wrong in my opinion then and I think he is now. I do not believe there is a superintendent here that would tolerate any such warlike practices in his mill. I do not believe there is a superintendent here but who will meet the technical man half way in any fair and square deal.

Would Endeavor to Get Together

If I was a technical man about to install some new system of operation in the acid plant, I would endeavor to get the superintendent, foreman and the acid makers together and I would outline the programme, telling them exactly what we expected to accomplish. I would probably say something like this: "Boys, when you put on a new pair of shoes they are apt to be uncomfortable for a day or two; when you put on the woolen suit last winter it wasn't as pleasant to your body as the B. V. D's., but you wouldn't have been as well off in the old shoes or the summer clothes. This change we are making in the plant may mean some inconveniences, perhaps you'll be sore, maybe you will be irritated, but we want to carry the thing through as outlined and you will find that the change will be for the best." I would further tell them: "I can't do this without you practical men, you can't do it successfully without a trained chemist; together we can do it."

Some engineers and chemists are doing things like this. The most of them are showing more tact than in former years. Perhaps it isn't exactly tact, it may be good sportmanship. It isn't sportsmanship for a university graduate to subject the victim of a pulp mill education to ridicule, simply because he has had opportunities the other fellow couldn't afford, so he doesn't do it. It isn't sportsmanship for the man trained in mill details to lead the technical man into blunders and then poke fun at him, so he has cut that out. I believe that the day of these things is past and that the time is here when the operators and technical directors, with mutual understanding and mutual respect for each other, are uniting their forces in the true spirit of service.

At the Champion Fibre Co.'s Plant

Some of you may ask what is done at the plant of the Champion Fibre Company at Canton, N. C., where I have been for the past eleven years, to encourage co-operation between te tchnical and operative forces, and how it works, and I do not hesitate in saying that I believe the daily meetings of the heads of departments, as arranged at our plant is a tremendous help in exemplifying our Champion Motto of "Co-operation-Good Fellowship." I might add here that this motto is posted in every room in the office and mill, from the private office of the vice-president to the place where we burn the brimstone. It is even in the "lab" and the engineering department.

When the whistle blows for twelve noon, the executive heads from the president down, go to the "Y" which is located near the mill and office, and there we play tennis, hand-ball, volley-ball, swim, bowl, play billiards or get on the side lines and rest. Play stops at ten minutes before one, giving the players time to take a shower and get to lunch at the main office at one o'clock. This noon-day meal is served at company expense to the "cabinet" or "dinner crowd." The line up is as follows: President, vice-president, and general manager, secretary and treasurer, auditor, soda mill superintendent, sulphite mill superintendent, sulphate mill superintendent, board mill superintendent, paper mill superintendent, wood-lands superintendent, plant engineer, designing engineer, superintendent of maintenance and construction, superintendent of power, superintendent of extract, chief chemist, service men (safety, etc.,) paymaster and sales manager.

A Round Table Meeting

At the table, we generally discuss the games played and who lost and why. After lunch, we go to the smoking room and the vice-president and general manager leads the meeting which is a decidedly informal one. Generally he has a list of the matters which he wishes to discuss and after these are disposed of, each one present is free to bring up any subject pertaining to mill matters. Instead of the "super" being compelled to visit various departments in the mill during the forenoon, he can jot down the matters he wishes to discuss and find his men open to interview at this gathering. Everyone gets an idea of what the other fellows are doing, how one department affects the other. The engineer's plans, the problems of the chemist and the dilemma of the mill man can be discussed in the friendliest way. No one resents the suggestion of the other fellow. There is the same spirit of comradeship during the play-hour, the lunch-time and the conference that you would expect to find among a bunch of good fellows off on a fishing trip. The chief chemist is "George," the head of the engineering department is called "Ced" for short, and I answer to the title of "Father." Suppose a man did feel a little grouchy along in the early forenoon, he would hesitate about telling "George" or "Ced" to go plumb to hell, when he knew he would have to eat dinner with him that day.

Strengthening the Fraternal Feeling

Another thing at our plant which puts the technical men on a good footing with the mill men, the room foremen and "key" men, is the fact that they teach vocational educational classes which are held at the "Y." Here the "key" men come to a realization of the fact that the tech man is interested in them, is their best friend, is helping them to prepare for promotion. Here the technical man develops a feeling of brotherly interest, the feeling that we all have when we have rendered real service.

The whole scheme carried on at the "Y," in which the men in the executive class, the men from the office and the men from the mill all play together, let the best man win, strengthens the fraternal feeling. I can think of no better evidence of this than the remark of a pipe-fitter, which I overheard one evening last winter down in the shower room. The boys were discussing a game just played and he spoke up: "I'll tell you one thing, them damn chemists and engineers are the best damn fellers in the whole damn bunch."

What are the reasons why we cannot all feel that way?

The schooled technician is often grieved by what seems to him to be the ignorance of the mill-trained executive.

The practical man is often annoyed by what seems to him to be the theoretical bunk of the college man.

The extent of their annoyance is measured by the capacity of each for human tolerance. Tolerance comes from fraternizing, however, more often than fraternizing comes from tolerance. The abstract follows the concrete. We act first and philosophize afterwards. I believe the Champion organization is following the lines of fundamental philosophy in getting the men to eat together and to play together before it hopes to get them to think together.

Herbert Spencer maintained that we must live before we act. Perhaps educated people would hesitate to take issue with Herbert Spencer, but Herbert Spencer never amounted to much in the sulphite mill, and there is no reason why a sulphite graduate shouldn't show him where he is wrong. The fact is that we have to act before we can live. We have to use our muscles before we get them. If we wait till we get muscle before we use it, we won't get any. It's the same with our brains. I don't understand how this is so, but it is so. The only way to learn anything is to do it. We have to swim before we really know how to swim. We have to make paper before we know how to make paper. And the chemist has to make experiments before he knows how they are made.

It seems to me that much of our failure to co-operate is neither the fault of the technical man or the "super," but comes from the fact that the mill and the school were not doing the same thing. The two ought to be brought together from the start, instead of having their separate graduates find ways of getting together afterwards. Much of our success in co-operation today is similarly due to the fact that the mill and the school are coming together. The school is becoming more concrete as the mills are getting a better grasp of general principles.

It used to be a pet phrase with us that there is a vast difference between theory and practice. It would be about as sensible to say that there is a vast difference between a horse's neck and horse's hind end. There is a difference to be sure, but not the sort of difference implied in the statement. If the hind end doesn't synchronize with the front, the horse won't win, even by a neck.

There can be no discrepancy between correct theory and correct practice. No two facts ever contradict each other If knowledge isn't practical, it isn't knowledge; and if practice isn't scientific, it isn't practical.

Where the Trouble Lies

To the technical men I'd say: the trouble lies not in any conflict between our facts and yours, but in the fact that we had been learning different things. We had been to school, although neither you nor we were aware of it. We had been doing things, therefore, we had been learning things. And the things that we learned were just as valid as the things that anybody has learned.

The problem is: How can you get engineering facts to fit in with operative facts? There is only one answer. We must begin to learn together. But because we learn only by doing, that means that we must begin to act together.

The story I told you of the Champion Mills may seem almost childish. I meant it to seem childlike in its simplicity for except as "Ye become as little children, ye can in no wise enter into the kingdom of knowledge."

How It Is Figured Out

We figured it out this way. There are some things at least, which we could all do—chemists and engineers and mill "supers" alike. There was one thing we were all good at, so we began there. We could all eat very efficiently. From that we went onto more involved processes—like playing tennis and taking a bath. Now we are learning to make paper together and we find it fun. I hope we don't stop there. I hope the mill men and the school men of these United States keep on doing things together. I hope we mill men do our part. I hope we contribute out little discoveries in practical production to the broader knowledge of the scientist, until the school and the college and the university shall be woven more tightly into our national life. And I hope that you technical men shall show us eventually how to transform our factories and mills, into institutions of culture, so that every worker shall have the fullest opportunity for mental and spiritual development and we shall learn the ultimate truths of life by *doing* them.

BLEACHING OF SULPHITE PULP*

By B. M. Petrie, Vice-President Eastern Mfg. Co.

In writing this paper, the writer has endeavored to relate his own experience in the bleaching of sulphite pulp which covers a period of twenty-three years. As there are several factors which influence the bleaching of pulp, it would perhaps be well to first mention a few of the most important ones.

Cooking Acid

Cooking acid has a direct effect on the bleaching properties of pulp. Acid that has been made with a weak SO2 gas, contains a high percentage of Calcium Sulphate, which in turn coats the fibres and prevents an easy penetration of the bleach liquor. It also forms a nucleus upon which pitch clings, thus forming yellow spots in the finished pulp. Weak acid unless handled carefully in a digester does not thoroughly dissolve the non-cellulose matter, and if this is not done properly, necessitates too energetic a bleaching.

Cooking

There are several methods of cooking digesters in sulphite, depending upon the quality of pulp desired. Pulp for high-grade bleached sulphite is cooked from 9 to 15 hours, depending upon the moisture content of the chips. The cooking must be thorough, yet not overdone, as burnt pulp bleaches hard and has less strength and is another source of pitch trouble.

Washing

The treatment pulp receives in the blow pits influences the bleaching greatly. Immediately after a cook is blown, the drain valves on the pit should be opened and the waste liquor gotten rid of while it is hot. The top or wash water should be added soon after. If hot water is available to wash with it will greatly assist the bleaching and where no hot water is available, a good substitute can be provided by putting two or three feet of cold water in the pit previous to blowing. All water used in washing should be fresh water from the mill supply. White water should never be used as it is polluted with resin. Stock in blow pits should be washed until 3 cc. of N/10 sodium hydroxide will neutralize 100 cc. of the water caught at the drain valve.

Bleaching

There are various types of bleachers, the two most commonly used are the circular tank and the Bellmer. Agitation is necessary in both, and is provided in the circular tank, either by mechanical agitators, compressed air, or centrifugal pumps. The Bellmers are agitated by right and left hand cast iron worms, mounted on a shaft and enclosed in a case.

There are two methods of bleaching known as the continuous and batch systems.

The continuous method is practiced in the tank installations, which consist of a series of circular tanks. The stock, bleach and heat are admitted to the first tank and flows either by gravity, or is conveyed mechanically through the series at a rate depending upon its density. The lower the density the more tank space is required or a higher temperature is necessary. With high densities the reverse is true. There are continuous systems operating today with stock as high as 13 per cent, in which case it is necessary during warm weather to cool the bleach liquor by refrigeration in order to keep the final temperature down to the desired point.

The principal objection to the continuous tank system is the difficulty of control. At low densities, 3 or 4 per cent, a small change in density means a large change in water content. Consequently when the stock changes, the strength of the bleach liquor is changed and the temperature is changed. All these variations have to be counteracted by hand regulation, thereby introducing the human element, which is never constant and which it is so desirable to eliminate from process controls.

Bellmer bleaching is carried on, with very few exceptions, in batches. Each Bellmer is a separate unit and each change of pulp is bleached and washed independent of the others. In any system the stock should be admitted at the desired density at all times. The best way is to thicken to a point beyond and then thin back with warm water; by so doing a large amount of acid is squeezed out and the stock is partly heated in a gentle way, which is desirable. The bleach liquor should also be added evenly. This can be accomplished in several ways, one very satisfactory method is to install a Cochran liquid weighing apparatus in the liquor line leading to the bleachers, then by setting a valve the required amount will be delivered and recorded on a revolving counter.

If bleach liquor is allowed to run on the stock in excess it will reduce the strength of the fibres and increase the amount of oxycellulose. Both are a detriment, the former in paper making, and the latter in other processes in which bleached pulp is used. All bleachers should be equipped with recording thermometers and the operator given a predetermined curve or line to follow. Low temperatures should be maintained. In Bellmers with a density of 6½ or 7 per cent a temperature of 85 to 90 degrees F. is sufficient.

Bleach Liquor

The preparing of bleach liquor from powder is a very important part of bleaching for both economy and quality.

Plenty of tanks and sufficient time should be allowed in order to get all the chlorine out of the powder. This can be tested by weighing the powder going in and analyzing it for available chlorine and measuring the solution coming out and analyzing it for available chlorine for a definite period. Good mill practice should give two gallons 5 degrees Bé. bleach liquor for every pound of 35 per cent powder.

Some mills make their own bleaching solution from chlorine produced by the electrolysis of salt or from liquod chlorine purchased in drums or tank cars. This is done by dissolving the chlorine in mild of lime either in towers or in special apparatus such as is put out by the Wallace & Tiernon Company.

Conclusion

Sufficient bleach liquor should be used to produce the desired color, and when this color is obtained, the stock by test should show that the chlorine is about exhausted. It is desirable to have a trace of chlorine show at this time, for if the bleaching is continued after the bleach is exhausted the color of the pulp will "go back" very rapidly and it is impossible to get the former color by applying more liquor.

The efficiency with which pulp can be bleached depends almost entirely upon the quality of the unbleached pulp. Pulp that is cooked unevenly cannot be bleached evenly, therefore great care should be exercised in having all digesters blown at the same test, and if for any reason the color of the liquor is not always the same at this point, steps should be taken to make the color and test of one digester correspond with all others at the time of blowing. The writer knows of an instance where the amount of 5 degrees liquor used in an eight-ton Bellmer only varied 250 gallons per batch for an entire year due absolutely to the stock being the same for that period of time.

Several changes and improvements can yet be made in most all bleaching equipment, especially in Bellmers. At present the largest Bellmers are about 45 feet long and hold 8 to 8½ tons. By installing a Moore & White propeller on each end and using the middle compartment as an outlet on one end and as an intake on the other end Bellmers can be built 100 feet long with cubic content sufficient for 25 tons.

*Read at the Spring Convention of the American Pulp and Paper Mill Superintendents' Association, Waldorf-Astoria, June 3-5, 1921.

PAPER MILL OPERATIONS*

By Nelson R. Davis, of the S. D. Warren Co., Cumberland Mills, Me.

The value of controlling materials and processes is everywhere admitted because it is everywhere practised. No mill making fine writings would consider dumping rags "as is" into their kettles and continue the process. They would either sort the rags at the mill or buy graded rags, thus effecting a degree of control over their raw material.

Similarly in a sulphite mill, even if it did not have a recording instrument in it, the cook would endeavor to control the process by the color and smell of the cooking liquor. Thus we see that the problem is not so much of the value of controlling materials and processes, but how far in the line of paper which any individual mill turns out, is it profitable to follow detailed, specific methods of control. In a mill making a high grade bond paper it might be profitable to sample each car of stock going to the beaters and have it tested for moisture, or other qualities, so that the beater man might maintain absolute uniformity in the beater. This would hardly pay for itself in a fast running book paper mill, and would seem the height of folly in a modern news mill. From this point of view it can be seen that a sense of proportion and of relative values is vitally important before entering on a program of standardization. At the same time, however, it must be realized that the technique of paper making is continually advancing and what seemed useless refinement ten years ago is common practice now.

You gentlemen who have been in the pulp and paper manufacturing business since boyhood can well remember when many grades of so-called quality papers were concocted very much the way our grandmothers used to cook—no cook book and no set rule were used but a pinch of this and that and every other element a varying factor.

The technique of pulp and paper making has advanced and will continue to advance hand in hand with the public demand for paper which will best serve its purpose with uniformity from day to day, and at the lowest possible cost. A well known paper consumer has very aptly said that uniformly poor paper is preferable to paper, the quality of which varies.

Controlling Materials and Processes

The result then of controlling materials and processes in paper manufacture is first, to make paper more uniform; second, to make it at the lowest possible cost; and third, to enable the manufacturer to meet competition in a most businesslike and scientific way.

It has been my experience that the successful paper maker must know the characteristics of the various materials which go into his beaters. A bleached sulphite pulp which is particularly adapted to making a firm, snappy bond, may not be the best sulphite for obtaining those leathery qualities which are so desirable in body stock for coating. Once the paper maker determines what qualities are necessary in a sulphite pulp to produce the kind of paper he manufactures, then he should take the necessary steps to insure uniform quality in that raw material. This is comparatively easy if the superintendents manufacture their own sulphite since modern methods of automatically controlling and recording of acid making, cooking and bleaching reduce to a minimum that variable factor known as the human equation. This is not so easy if the paper maker does not make his own sulphite but there are so many pulp manufactures today both domestic and foreign, most of whom are better equipped than ever before to supply a definite need that the superintendent ought to be able to select that pulp which will give him the maximum of results at a minimum of cost.

Various tests may be applied to purchased pulp and while they may not be entirely indicative of the quality of the pulp, they are at least comparable and if made from time to time as shipments come in, may be used to indicate its uniformity. I refer to the beating of a small charge of the pulp in a laboratory pebble mill for a definite period then making into hand mould sheets and testing the bursting strength with the Mullen tester and the tearing strength with the Elmendorf tester. There are, I believe, certain sedimentation tests which are applicable but with which I am not thoroughly familiar.

What pertains to selecting the most efficient and economical sulphite pulp also pertains in a very high degree to other pulps, fillers and chemicals used in paper making. Elbert G. Milham in a paper delivered before the Chicago Convention last November, very ably pointed out to us the necessity of testing all raw materials entering our mills, both from the standpoint of making uniform paper and from the financial standpoint which we must from now on consider very seriously. If there are any new members who have not read Mr. Milham's paper, I hope you will do so.

To Obtain a Given Result

Assuming then that we have provided the proper quality of raw materials for the particular grades we wish to make, we naturally should determine with reasonable precision, what quantities of those materials must be put into the beater to obtain a given result. Once those quantities are established for every given basis weight and grade, and means are provided for furnishing the beater accurately, a standard furnish can be made up, kept on record, and a clerk can make up the beater furnish for every order, thus taking the matter out of the hands of foremen and beater engineers and eliminating variables which would otherwise creep in.

Papers require varying degrees of rosin sizing in accordance with the purpose for which they are to be used. It has been the practice of some mills making book and fine papers to allow the engineer to use whatever quantities of alum and rosin size he thinks necessary. This is not only poor practice conducive to variations but is extravagant in most cases. One book mill I know of when it started to prescribe the quantities of these materials to be used and established means for obtaining accuracy, not only made more satisfactorily sized and uniform paper but incidentally saved thousands of dollars per year in these materials.

This practice of the standardized furnish can be most satisfactorily put into use where the beaters are all of one type and capacity and where means are provided for furnishing to a uniform density.

I am a firm believer in standard beating equipment. Various modifications of the Hollander type beater all in the same mill and used for beating the same grades only lead to confusion among engineers and are conducive to irregular product. Since heavy rolls, high contact pressures, thin knives and high speeds give sharp cutting results such as are wanted in the manufacture of high bulking papers, so low contact pressure, thick knives and less of them are necessary for obtaining great strength. The same paper can not be, in my judgment, as satisfactorily made on both kinds of equipment. A uniform type and size of beater, operated at a definite speed should be used throughout a mill making a standard quality of product. I will not say more in this connection as Mr. C. C. Stewart is presently to read a paper dealing with this specific problem.

It is a well known fact that different engineers will furnish beaters varying in density at least 33⅓ per cent. If the jordan and machine chests are large, this variation is not always serious but in some mills a much more uniform product results by attempting to keep this variation down to a minimum.

Various methods of controlling the consistency are being developed and doubtless will soon be marketed.

*Read at the Convention of the American Pulp and Paper Mill Superintendents' Association, Waldorf-Astoria, New York, June 3-5, 1921.

Preparation of the Stock

The actual preparation of the stock in the beaters is one which no one as far as I know has as yet satisfactorily taken out of the hands of the skilled engineer absolutely. Various devices have been developed to a point where they serve as an excellent guide to the engineer as the stuff is being beaten and aid him in keeping the variations in quality within much more narrow limits, but as the technique of paper making is continually advancing I look forward to the time when we can control more accurately the quality of the stuff going into the jordan chest—and by mechanical means.

Proper agitation in jordan and machine chests is a problem which I, at least, have not regarded with as much importance, until recently, as it deserves. How often we look into a chest with the old straight arm agitator and see the stuff traveling almost in a solid mass without being thoroughly mixed. Proper agitation has a very direct relation to uniform weight and quality, and we cannot afford to neglect it.

If we have taken advantage of our opportunities for standardization up to this point, we have made a little less complex the problem which the machine tender has of control of his machine. We can install recording tachometers which will constantly indicate to the machine man whether his machine is varying in speed, but the matter of head flow, suction and the various finer adjustments must be left to the skill and experience of the operator, whether it ever will be desirable to attempt to control these elments, outside of drying, and to what extent, is a matter of opinion.

CAUTERIZING PROBLEMS IN A SULPHITE MILL*

By Norman E. Brokaw, Consulting Engineer, Edgerton, Wis.

The causticizing operation is a part of the sulphate process which has great possibilities for good or evil in the efficient handling of the plant. In spite of this fact it receives very little attention from many superintendents and foremen. Whether this is because of its apparently simple manipulation in comparison with other parts of the process or a failure to realize the opportunities presented is not pertinent to this discussion. However, personal observation in several sulphite mills convinced me that the greatest increase in efficiency and attendant lowering of production cost could be obtained by changes in method of the causticizing operation or more careful supervision of existing methods.

Before going into the individual problems and methods, which vary with the different mills, it might be well to consider some of the general features. The causticizing operation is that part of the sulphite process by which the raw, or green, liquor is causticized and the sludge washed to extract the remaining soda. This operation is carried on in steel tanks equipped with agitators, syphon pipes, steam pipes and in most cases, lime baskets. The green liquor is pumped to these tanks from the dissolving tanks and lime added to further causticize the liquor, that is, transform the major portion of the sodium carbonate to sodium hydroxide. Live steam is injected and the agitator kept running during this period to hasten the action. After this cooking of the liquor has proceeded for a given period the liquor stands for several hours to allow the carbonate of lime that has formed to settle. As much liquor as can be obtained clear is then decanted by means of the syphon pipe and the remaining sludge washed by various methods to recover the soda that it contains. In maintaining this operation at highest efficiency there are several problems that require careful consideration, chief among which are the following: density or strength of liquor, quality of lime, amount of lime required, cooking and settling of liquor and recovery of soda from the sludge.

Density or Strength of Liquor

The question of the proper strength at which to maintain the cooking liquor cannot be answered arbitrarily as it varies greatly with local conditions. There are several factors to be considered in determining this, notably, the evaporating capacity of the mill, the moisture content of the chips, the method of cooking (direct or indirect) and the capacity of the caustic tanks in relation to the balance of the plant. If the evaporating capacity is less than it should be the density may have to be kept above the point of highest efficiency in order to keep up the production. Wet chips with direct cooking reduce the density to a very considerable degree and should be made allowance for. It is the contention of some that the density should always be kept at the highest possible point in order to eliminate the evaporation of extra water, but it has been my experience that too high a density can be obtained. A high density of liquor when cooking indirect and using dry chips will not thin the charge enough so that the digester will blow clean. If the capacity of the caustic tanks is too small the natural conclusion would be to increase the density of the liquor and so obtain more cooking strength for the same volume. However, it will not work out that way for the sludge settles much slower in heavier liquor and a larger percentage of the soda is left in the sludge to be recovered. A lowering of the density by ten or fifteen per cent may so facilitate the operation that a considerable increase in production and efficiency may be obtained.

Quality of Lime

The use of a high calcium lime is essential to the successful operation of a sulphite mill. One in which the per cent of Calcium Oxide is 92 or better should be obtained if possible. A small amount of insoluble matter or water is not as harmful as a like quantity of Magnesium Oxide in the lime. Where the latter runs above four or five per cent it is bound to cause trouble as it does not react with the Sodium Carbonate and settles out very slowly.

Amount of Lime to Use

This depends somewhat on the percentage of causticity required, a point on which there is some difference of opinion among operators. It is generally conceded, however, that from eighty-five to ninety per cent of the soda should be in the form of Sodium Sulphide and Sodium Hydroxide in the cooking liquor. Where a higher causticity is obtained there is a waste of lime since the chemical action is not a complete one and an excess of lime has to be present to obtain it. This excess, in addition to being a waste of lime, remains in suspension and settles very slowly, thus delaying the operation.

The common method of determining when to pump the liquor from the dissolving tank to the caustic tank is when to pump when it attains a given density, usually determined by use of a Beaume scale hydrometer. In some cases there is a standing order for the caustic cook to use a certain amount of lime, measured by either weight or volume as the case may be. Then if the results are not satisfactory for several tanks of liquor the superintendent will order a little more or less lime as the case may be. This method is not conducive to efficiency or a uniform cooking liquor for the percentage of sulphide in the green liquor may vary considerably even in a very uniform recovery operation. Also there may be tanks that show a false Beaume due to unreduced sulphite in the liquor. The wash water used in filling the dissolving tanks may also vary considerably in strength so that sometimes when a strong wash has been used

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the percentage of Sodium Hydroxide is double that in other tanks.

In order to maintain a uniform causticity and avoid the waste of lime the liquor should be tested to determine the amount of Sodium Carbonate to be causticized. The sample for this test should be taken after the green liquor is all pumped to the caustic tank and well mixed. This test can be made in a few minutes and with the aid of a chart the correct amount of lime to use is obtained. I have found that in a seemingly uniform operation and without changing other parts of the process that the correct amount of lime will vary as much as twenty-five per cent from one tank to the next.

The ideal is to obtain the highest per cent of causticity without having an excess of lime. The first will give a strong cooking liquor for its density and mean a minimum volume per digester charge and no excess of lime enables the drawing off of a larger volume. Sometimes when an excess of lime has been used only about half the total soda in the tank can be drawn off in the strong liquor whereas when properly operated three-fourths should be obtainable.

Cooking and Settling of Liquor

The liquor is cooked during the time the lime is being added and for a period after that by the injection of live steam to keep the temperature at 200 degrees F. or a little above. I have found by tests that if the steam is kept on and the agitator kept running for one hour after the lime has all been added that the action is practically complete. These tests have shown an increase of three or four per cent in causticity during the second half hour of cooking. The length of time required for settling properly will depend on the causticity and the condition of the lime used. If the lime is somewhat air slaked it will not settle out as readily as when it is fresh. These factors should be taken into consideration in every case and sufficient time allowed for proper settling.

Recovery of Soda from the Sludge

After the finished liquor has been decanted usually twenty-five per cent or more of the soda is left in the tank. The solution containing this is mixed with the carbonate of lime and excess of lime which is commonly termed the sludge. There are two general methods of separating the soda from the sludge, one by the aid of filter presses and the other by several washes and decantation of the wash water.

When filter presses are used one of two courses is usually followed. In some mills the tanks are filled after decantation of the liquor and then after thoroughly agitating, the entire contents is washed out and run through the filter. The solution, or wash water obtained from the filter is then used for filling the dissolving tanks. In other mills the caustic tank is filled with wash water that has been obtained from the filter press in a previous operation and after thorough agitation is allowed to settle and the wash water decanted to be used for filling the dissolving tanks. Then the tank is filled with fresh water and the entire contents run to the filter. Either of these methods will produce good results but the efficiency of the latter is higher. Mills using filters are probably averaging smaller losses of soda in the causticizing operation than those which do not though many of the latter could obtain as good results by employing proper methods. The use of filters will increase the labor cost somewhat for their operation and upkeep. In some plants it is impracticable or even unlawful to dispose of the sludge by running it into the river and the use of filter presses enables a mill to get away from this. The sludge, in solid cake form as obtained from the filter, can be burned to recover the lime or otherwise disposed of.

In the recovery of the soda without the use of filters the commonest practice is to transfer the washes from one tank to another and only use the first or strongest wash from each tank for filling the dissolving tanks. After this system has been put in operation it works as follows: After the liquor has been decanted from one tank a second wash is decanted from another tank and pumped to the first tank. A fourth wash is then transferred to that tank to make a third wash and the sludge washed out of the tank from which the fourth was taken. The first wash is decanted to a feeder tank for the dissolving tanks or may be conveyed directly to the latter. The third wash is then pumped to that tank to make a second wash and the tank from which it was taken filled with fresh water to make a fourth wash. This is a rather complicated system and requires careful supervision to see that is properly followed. In too many cases there is no caustic room to spare and the fourth wash has to be neglected to make room for the next pumping from the dissolving tanks. In several mills where this situation prevailed I was able to increase the soda recovered in a marked degree by making all fresh water washes. To do this and recover all the washes for use the volume of each wash has to be greatly reduced. However, the washes will settle much quicker when using fresh water and each tank being operated independently, the washes can be made according to a regular schedule of time to settle, agitate, etc. I have obtained an average recovery of each over ninety-five per cent of the soda in each tank by this method with three washes when the time for a complete cycle was only eighteen hours. With four fresh water washes and twenty-four hours or more to a cycle the recovery was almost perfect.

The losses in the causticizing operation may not appear to be very important at first thought nor the results of careful handling commensurate with the time and trouble required. However, if we consider what some of these losses mean in dollars and cents their importance is very apparent. A reduction of ten per cent in the amount of lime used caused by testing of the green liquor and proper cooking would mean a saving in a fifty ton mill of from $35 to $50 a day at present prices. A reduction of only three per cent in the soda lost during the causticizing operation for the same mill would save about $40 a day in chemicals alone.

The successful operation of a sulphite mill is dependent on the efficiency of the recovery system and to maintain this at the highest point, no part of the operation can be neglected. We are at present in a period when low cost of production is a more vital factor than it has been for the last few years, so no possible opportunity for saving should be overlooked. In the light of these facts the causticizing operation and its various problems should receive the especial consideration of sulphite mill superintendens at this time.

To Hold Power Conference in New York

[FROM OUR REGULAR CORRESPONDENT.]

DAYTON, Ohio, June 6, 1921.—The Water Power League of America of which George H. Mead, of the Mead Pulp & Paper Company and other paper enterprises, is an advisory councilman, will hold a manufacturers' power conference in New York June 21-22, it is announced here. The meeting will be held at the Waldorf-Astoria.

The object of the session will be to discuss power development, power shortage and fuel supply and costs.

It is stated that all governments of the world are rushing to completion hydro-electric developments, with the possible exception of the United States; that the utilization of the now-unused 50,000,000 water horsepower in this country would mean a yearly saving of fuel valued at one and a quarter billion dollars, and would release 800,000 men from the labor of mining and transporting coal.

Manufacturers are asked to join in a movement to keep this power from being exploited for a few and to use it to supply cheap and constant power. Considerable interest in power development always has been manifested in the Miami valley.

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MANUFACTURE OF COATED PAPER*

By Wm. T. Schenck, of the Champion Coated Paper Co., Hamilton, Ohio

Mistakes we make and mistakes the printer makes. It is but human to err, and we must all admit that sometimes we are in the wrong.

I have been in the coated paper business for about 27 years, and have seen many changes in its manufacture in that time. If we were to go back to the ways of 20 or 25 years ago, we would soon go out of business. The "coating game," like every other business, never ceases to improve.

We will have a little discussion on the manufacture of coated papers.

Manufacture of Coated Paper an Art

The first thing to bear in mind is that the manufacture of coated papers is an art from beginning to end, but we very often forget this. The fundamental thing in making good coated papers is this: The raw stock must be made just right for each grade. We must not forget that we are going to make something artistic out of this raw stock. Its requirements are mostly—good formation, uniform weight, free from fuzz, and the proper uniform color. Starting with this, we are on the right track to begin this work of "art going."

Then comes the mixing of the coating and tinting, etc. The color mixer must know how to properly mix his coating materials, and get them uniform, or we are going to turn out a very poor lot of paper, even if all the other conditions in the process are good.

We next come to the coating machines. The machine runner must positively know how to apply this coating material to the best advantage, and see to it that it is properly coated, as well a uniformly, and must be an artist in his line, as this is one of the important steps in the manufacture of coated papers. Of course, the different mills have many different methods of doing things, and many are the small things that the coater man does to make an artistic sheet. Our method with the men has always been to try to impress upon them the fact that this is a "work of art," and that they are not ordinary workmen, but artists. One cannot be too emphatic with the work on the coating machines; it takes skill.

Drying and Reeling

The next step is drying and reeling, which is mostly mechanical—then comes the finishing of the paper. It is run through super-calenders—you all know what they are—here is where the *real* artists gets in his *reel* work; he can either make or mar at this point. A good calender-man must be able to tell at a glance, or by the "feel" of the sheet as it is going through the calender, if it is all right, or not; he must be on the "look-out" at all times and watch how "she is calendering"; also, the trained eye can detect a spot on the sheet while it is running. The calender-man must also watch closely for any change in the moisture of the sheet running, in order that it is not "crushed" or "blackened." In fact, this part of the operation is one of the very important ones, and the greatest care must be taken at this point. The finish and pressure on these machines should always be established by the foreman, and the calender-man should be given a sheet by which to run; if he is a good man, he will closely follow the sample.

The Cutting Off Process

Then comes the cutting-off process; most of the paper is laid off by mechanical means. All coated papers are sorted one sheet at a time and all defective paper taken out. Now, right here is where we are all weak; that is, all coating mills must rely entirely upon the judgment of the sorters—and here is where one has the human element with which to contend. The sorters are supposed to take out all bad paper, but—do they? We have established a very thorough way of inspection, but at that, some defective papers will slip in, and here is where we "get in bad" with the printer.

He runs across a wrinkle or some foreign substance, and "smash" goes his plate; of course, the mill is to blame, and some of the printers do not look at this trouble in the correct way. They think the coating mill is not sorting its paper; they make a big kick and charge-back; of course, this is all right, but the printer can hardly blame the company for this defect, as the coating mill has tried its best to have all defects taken out. I know that all mills have this trouble but I hope the printers realize that no mill would knowingly send out defective papers.

Mill Not Always at Fault

At our last convention in Chicago, I laid this fact before about 200 printers who attended our session, and many of them told me that they did not realize what we were up against, and would be more lenient with us in the future. We will at all times stand back of all legitimate claims, but many times the mill is not at fault on some of the claims.

The printer also has the human element with which to contend; his workmen are sometimes to blame for some things, and it is an easy matter to shift the blame on to the mill.

I have known the printer to make complaints, which I am positive originated in his print shop. There are many little adjustments on a printing press that can get out of order, and make it appear that there is some defect in the paper. Let us be honest about this matter. If the mill is at fault, let the mill take the blame, but if the fault is in the printshop, please put the blame where it belongs. We have had a number of complaints which I positively know were the fault of the printer—and not the paper—that particular job, but rather than argue with him, we allowed the claim.

Many times a certain grade of paper is specified on a job, where another grade should be used; nobody knows this better than the printer. But, what is he going to do when he has orders to run a certain job, and must take paper that *might* do, because the proper stock is not available? He will get the job on the press, and it will not work right nor look right; then and there is where the mills "get theirs."

The Finish of Paper

Right here is where I would like to go on record about these different grades of papers. I have talked with many printers on this subject, and had quite an argument with that bunch of printers at Chicago, in regard to the present highly finished surface, and they all agreed with me that a semi-dull velvet finish was much more to the point, and that it enabled the printer to bring out the fine half-tones, and make an artistic job of it. They get much better results with the semi-dull than with the very high glossy finished papers. It is impossible to get an extremely high gloss without destroying the surface for printing—that is, for good printing. A more or less crushed and hard sheet is the result—the ink will not dry, and the color of the cut will show gray and blurred instead of clean and sharp. Of course, the dull finish will require a little more ink, but it will be well paid for in the results obtained.

High Glossy Surface Will Disappear

I feel that in the near future, the bulk of coated papers will be made dull finish or semi-dull and the high glossy surface will

*Read at the Spring Convention of the American Pulp and Paper Mill Superintendents' Association, Waldorf-Astoria, New York, June 3-5, 1921.

Plant No. 1, St. Louis, Mo.

HEINE LARGE-UNIT BOILERS are among the very few power-plant boilers for which there was an increased demand last year.

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gradually disappear. A dull surface on coated papers is much more difficult to manufacture than the high finish, as the printing surface must at all times be smooth, in order to get good printed results. I find that since my meeting with the Chicago printers last fall, that our business on dull coated papers has more than doubled; in fact, "it seems to be the go."

I would like to quote here, an article from our Year Book of June, 1920, by Mr. P. J. Massey, Superintendent of W. F. Hall Printing Company, Chicago. He says:

"I would like to ask, why do paper makers exert so much effort, and time, with the attending necessary waste, to get an excessively high finish and mirrored surface on their papers? I am sure that every press room executive present will agree with me when I say that you are not fulfilling the press room requirements by so doing, but that you increase their troubles, in addition to destroying the eye-sight of the general public."

Another thing of importance is—when a customer sends in an order, it would be a great help to us and a benefit to him, if he would state just what kind of printing is to go on the paper; or better yet, to send a good sized sample with the printing on it, showing the requirements. As a rule, we get very small samples from our customers and many times they are so crushed, that they are scarcely recognizable as a sample, besides being very much soiled so that it is difficult to judge from the sample just what is required.

With a little more care and co-operation from the customers and printers, we can make life a little more pleasant for the superintendents of the coating mills, and also for the printers.

THE SOUTH AS A SOURCE FOR PAPER*

By Sidney D. Wells, Forest Products Laboratory

In considering a suitable subject to present to a general convention of this nature, I believe a brief account of some work on the pulping of resinous woods for bleached pulp would be of interest. The reason for this belief is the fact that over half of our standing timber consists of coniferous woods too resinous to be utilized with any degree of success by the sulphite or groundwood processes. A large portion of these species are pines, which occur in the Southern States, and much of it is relatively near to the large centers of paper consumption when compared to any considerable stands of spruce, fir or hemlock.

Experiments by Forest Products Laboratory

While pulps of fair quality have been made from a few of the southern pines, using the sulphite process, the narrow range of conditions under which results were obtained by the Forest Products Laboratory, United States Forest Service, Madison, Wis., and the variability in resin content, not only in different species but in the same species, made it appear probable that considerable trouble would be experienced in using the process and attention was directed to pulping the same by the sulphate process or modifications of the soda process whereby the advantages of the sulphate process were obtained.

The first cooks were made under more drastic conditions than is customary in producing pulps for kraft paper and low yields of between thirty-five and forty per cent, based on the weight of the chips, resulted. It was found possible to bleach the pulps thus obtained with between twenty and twenty-five per cent of bleaching powder (based on the weight of pulp), while the usual kraft pulps from the same woods could not be bleached with as much as forty per cent. Studies on the chemical constitution of the pulp, however, made it appear evident that the severely cooked pulps with low yields and the usual kraft pulp with normal yields, differed very little and the color of the unbleached pulps was not due to impurities in any considerable amount, but to coloring agents of the nature of a dyestuff with strong tinctorial power and a marked degree of fastness. It consequently seemed desirable to work out bleaching methods whereby larger yields of pulp could be satisfactorily bleached with corresponding increases in the capacity of the pulping and recovery equipment and saving in chemical consumption.

Work in Preliminary Stages

The work along these lines is not only in its preliminary stages but it has been found that by bleaching in two steps with a washing operation after each, will make possible the reduction of bleach consumption to approximately half of what is necessary in one step and at the same time a much brighter color is obtained. Kraft pulps obtained with a yield of forty-two per cent have been bleached to very satisfactory degrees with bleach consumption of between eighteen and twenty-two per cent and it is felt that further work will make possible the bleaching of pulps obtained with even larger yields with comparatively low bleach consumption. The pulps after the first step in bleaching, possessed considerable color but a large amount of coloring matter was removed in the washing operation and the second step produced the desired results quite readily. The operations involved are not complicated and existing systems could be adapted with slight modifications. Double the amount of bleaching equipment necessary per unit of production would probably be required but the increased capacity of the other departments of the mill would more than compensate and a much larger yield per cord of wood would result with pulp of superior quality.

Not Much Promise of Relief

The use of southern woods does not hold much promise of relief to existing sulphite mills and will not directly increase the supply of news print. It is felt, however, that bleached sulphate pulp could be used to advantage in the manufacture of a considerable portion of our book paper and other grades where bleached pulp is essential and would serve to release that much sulphite. The amount of wood available is several times the amount of standard pulpwoods and the rate of growth several times that of northern conifers.

It may seem inappropriate at this time to suggest means of extending our pulpwood supply when we have just passed through a period of marked reduction in price and there seems to be plenty being offered for this year's consumption. Many keen observers of the situation, however, are of the opinion that the present condition is as temporary as the radically different conditions of two years ago and we are destined to feel the pinch as soon as conditions become normal.

In surveying the horizon for means of extending our sources of paper making material, the use of southern pines seems worthy of consideration.

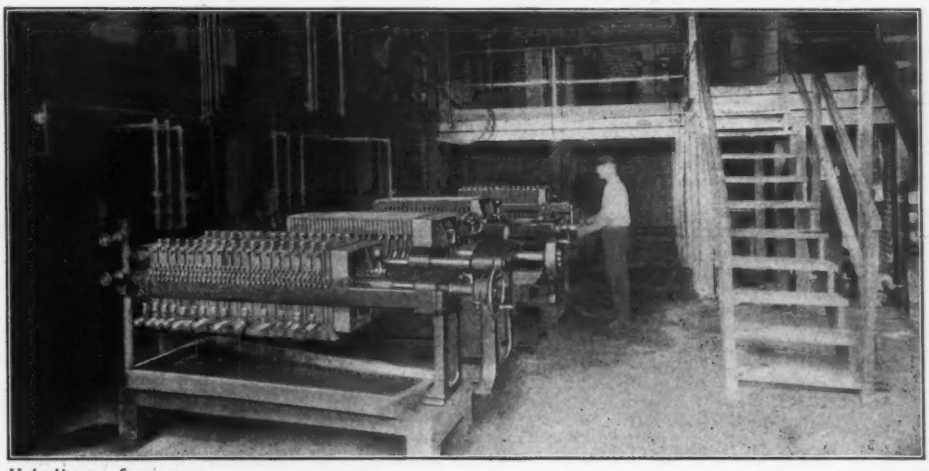
*Read at the Spring Convention of the American Pulp and Paper Mill Superintendents Association, Waldorf-Astoria, June 3-5, 1921.

F. L. Carlisle at Labor Conference

[From our regular correspondent.]

Watertown, N. Y., June 6, 1921.—Floyd L. Carlisle, president of the St. Regis Paper Company and representative of paper manufacturers of the country on the labor strike situation, returned Friday from Albany where he had been in a conference with labor leaders concerning the settlement of the strike in numerous paper mills. He was absolutely uncommunicative on the subject of his experience at Albany and what occurred.

"I have nothing to say on the arbitration subject nor the details of the conference," answered Mr. Carlisle, when asked for a statement.



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Abstracts of Articles and Notes of Papermaking Inventions Compiled by the Committee on Abstracts of Literature of the Technical Association of the Pulp and Paper Industry

Warner's Patent Equalizer.—*Paper,* xxvii, 10, 210 (Nov. 10, 1920).—Brief description of a consistency regulator covered by U. S. Patent no. 1,225,086, May 8, 1917, and Can. patent no. 178,495, July 31, 1917.—A. P.-C.

Paper Barrels.—Fr. patent no. 506,383, Maxence Isnard, France, (Isère), May 28, 1920. *Papier,* xxiii, 266 (Nov. 1920).—A receptacle is made with its inside walls of the shape of the outside of the desired article, said walls being constituted by a fine wire gauze, or other material permeable to liquids. This receptacle is given a rapid rotary motion by its vertical axis, and one or more jets of paper pulp is directed horizontally against said receptacle. Owing to the combined action of centrifugal force and the pressure of the jet, the fibrous material is felted and thoroughly compacted. When a sufficient thickness of pulp has been deposited, the article thus prepared is removed and the top and bottom put in place. The shrinkage which occurs on drying firmly fixes the latter in place.—A. P.-C.

Paper Web Carrier from Driers to Calenders.—Can. patent No. 206,167, Charles E. Pope, Springfield, Mass., U. S. A. (Jan. 4, 1921.)—The combination with the drying rollers and calendering rollers of a paper machine, and a scraper co-operating with the last of the drying rollers, of brackets attached to the machine forms and guide plates supported by said brackets arranged to form a guiding passage between said rollers, having an inlet opposite the scraper, and an outlet at the bite of the calendering rollers, and terminating remotely from the last drying roller to provide an open-ended unobstructed vertical space therebetween means for delivering currents of air at said scrapers for blowing a lead strip of the paper web across said space into and along said guiding passage, and means for delivering other currents of air into said guiding passage above the aforesaid air currents, said air currents being directed in the direction of movement of said strip and supporting the strip as it is moved along.—A. P.-C.

Fibre-faced Concrete Wall.—Can. patent No. 207,274, Bror Gustav Dahlberg, assignee of Herbert A. Sullwold, both of St. Paul, Minn., U. S. A. (Jan. 4, 1921).—The process of making a wall or roof of concrete which will be dripless on its surface, which consists in providing a suitable form, placing the fibrous material known as "insulite" on the interior of said form, applying said concrete in a fluid condition directly to said insulite to form a bond therewith, and after said concrete has set, removing said form, substantially as described.—A. P.-C.

McKee's New Sulphite Pulp Process.—Can. patent No. 207,307, Ralph H. McKee, New York, N. Y., U. S. A. (Jan. 11, 1921).—The process of producing paper pulp from resin-containing wood which consists in placing the wood in a sulphite digester, subjecting it to the action of liquid sulphur dioxide at an elevated temperature and at a super-atmospheric pressure, removing the main portion of the sulphur dioxide from the digester, adding sulphite liquid and subjecting the treated wood to the sulphite cooking process whereby paper pulp is produced therefrom.—A. P.-C.

Dilute Sulphuric Acid Preliminary to Sulphite Cooking.—Can, patent No. 207,319, Emile Bronnert, Mulhouse, Alsace-Lorraine, France (Jan. 11, 1921).—A process for the production of high percentage sulphite cellulose, characterized by the fact that under low pressure an opening up of the material by boiling with diluted, say 1 per cent, sulphuric acid, is allowed to precede the usual boiling of the already prepared wood material with calcium bisulphite or magnesium calcium sulphite liquor under pressure.—A. P.-C.

Rosin-wax Sizing Process.—Can. patent No. 207,336, Judson A. DeCew, Montreal, Que., Canada (Jan. 11, 1921.)—A process which comprises incorporating with fluent paper stock, a sizing composition containing rosin size and wax, and an aluminum compound capable of precipitating the same, making the material into paper, drying the paper, and heating the same to a degree sufficient to melt the rosin oil alumina compound by passing the same between heated pressure rolls maintained at a temperature above 100° Cent., whereby the molten material spreads itself, in fluid condition, throughout the body of the paper.—A. P.-C.

Aluminum Resinate Sizing Process.—Can. patent No. 207,337, Judson A. DeCew, Montreal, Que., Canada (Jan. 11, 1921).—A process of sizing paper stock, which comprises treating the same in a fluent condition separately with a solution containing a soluble aluminate and with a dilute solution of rosin size containing free rosin acid, the solution being diluted to such an extent that the free alkali in the aluminate solution will not saponify the free rosin acid in the soap solution. See also Fr. patent No. 499,415, May 12, 1919; *Pulp and Paper,* xviii, 756, July 15, 1920.—A. P.-C.

Logging Hook.—Can. patent No. 207,385, John Hyde, Vancouver, B. C., Canada (Jan. 11, 1921).—A. P.-C.

Method of Concentrating Solutions.—Can. patent No. 207,431, Edward Shaw, Toronto, Ontario, Canada (Jan. 11, 1921.—The method of concentrating solutions which consists of continuously heating a solution under pressure sufficient to prevent steam formation, and exploding the solution in a separating chamber below the water level in the chamber.—A. P.-C.

Acid-resisting Alloys.—Can. patent No. 207,477, Wilhelm Borchers and Rolf Borchers, both of Aachen, Germany (Jan. 11, 1921).—A process for improving the acid-resisting powers of metals of the iron group, consisting in alloying such metals with 30 to 40 per cent of chromium, about 5 per cent of another metal of the chromium group, and about 2 per cent copper.—A. P.-C.

Evaporating Process.—Can. patent No. 207,481, Aktiebolaget Indunstare, assignee of Nils Olof Soderlund, both of Goteborg, Sweden (Jan. 11, 1921).—An evaporating apparatus which comprises a chamber having an inlet and an outlet for a heating gaseous medium, means for introducing a heated gaseous medium in said chamber through said inlet, means for spraying the solution to be evaporated into said chamber, and a partition wall within said chamber between inlet and outlet to cause the gaseous medium to travel through said chamber in the direction of movement of the sprayed solution.—A. P.-C.

Press Roll for Pulp.—Can. patent No. 207,482, The Aktiebolaget Karlstads Mekaniska Verkstad, assignee of Rudolf Ernst Wagner, both of Karlstad, Sweden (Jan. 11, 1921).—A press roll for pressing wood pulp, cellulose and the like, provided with surface grooves, the width of which is less than 1 mm. and the depth of which is such that material pressed into the grooves will become pressed by the bottoms of the grooves, said grooves being located at such distances from one another that the width of the portion of the cylindrical surface of the roller remaining is at least equal to the width of the groove.—A. P.-C.

Grooved Press Rolls.—Can patent No. 207,483, Aktiebolaget Karlstads Mekaniska Verkstad, assignee of Rudolf Ernst Wagner, both of Karlstad, Sweden (Jan. 11, 1921).—A roll comprising a roll body, and a roll jacket around said body provided with generally longitudinal grooves in its inner surface, and with circum-

(*Continued on page* 62)

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(*Continued from page 60*)

ferential slots in its outer surface, said grooves and said slots having such depths as to reach one another.—A. P.-C.

Pulp Vat.—Can. patent No. 207,485, Aktiebolaget Karlstads Mekaniska Verkstad, assignee of Rudolf Ernst Wagner, both of Karlstads, Sweden (Jan. 11, 1921).—In a pulp vat and the like, the combination of a rotary strainer cylinder for gathering the pulp, and a press roller pressing against said cylinder and provided with peripheral grooves, notches, deep slots, or the like, for the purpose of rendering possible an increased pressing out of the pulp sheet gathered on the strainer cylinder.—A. P.-C.

Cylinder Strainer for Woodpulp.—Can. patent No. 207,484, Aktiebolaget Karlstads Mekaniska Verkstad, assignee of Rudolf Ernst Wagner, both of Karlstads, Sweden (Jan. 11, 1921).—In a strainer cylinder for wood pulp and cellulose, the combination of a pulp container, a rotary cylinder divided into cells, a strainer cloth surrounding said cells and forming the outer surface of said cylinder, and upwards rotating portion of said strainer cloth above the horizontal plane through the axis of the cylinder forming one wall of said pulp container, a stationary suction box located in the interior of said cylinder within said cells and having a suction opening opposite the upper part of said portion of the strainer cloth forming a wall of said container, and a wall opposite the lower part of said portion of the strainer cloth, said wall forming a stationary bottom for the cells covered by said part, for the purpose that during the rotation of the cylinder the cells moving into the pulp container shall at first be closed and shut off from the suction box and afterwards placed into communication with said suction box when a filter layer has been formed on the strainer cloth over said cells by natural straining.—A. P.-C.

Recovery of Waste Heat.—Can. patent No. 207,486, Aktiebogalet Karlstads Mekaniska Verkstad, assignee of Rudolf Ernst Wagner, both of Karlstads, Sweden (Jan. 11, 1921).—A means for recovering heat leaving paper machines and the like, comprising in combination a collecting vessel for steam, air and water, rotary surfaces in said vessel partly submerged in the water in the same, means for collecting and conducting the waste steam and hot air from the machine into said vessel, means for removing cooled air from said vessel.—A. P.-C.

Pulp Moulding Apparatus.—Can. patent No. 207,534. The Keyes Fiber Company, Waterville, assignee of Bert R. Williamson, Fairfield, both in Maine, U. S. A. (Jan. 11, 1921).—A. P.-C.

Electroosmotic Extraction of Water.—Can. patent No. 207,561, Gesellschaft fur Elektroosmose, m. b. h., assignee of Graf Motho Schwerin, both of Frankfort, a/M, Germany (Jan. 11, 1921).—A process of extracting water from animal, vegetable, or mineral substances by electroosmotic action wherein the material to be freed from water is subjected to the action of an electric current in a space of constant volume containing the electrodes under pressure or suction exerted or transmitted by the material itself and without any movement of the drying matter.—A. P.-C.

Logged-Over Land Problem.—*Timberman*, December, 1920.—Discusses problems incident to the clearing of logged-off lands of Western Washington and their settlement by farmers. Results of conference held at Seattle, Wash., December 6 and 7, 1920.—C. L.

Sweden as Source of Wood Goods.—H. M. Meloney, *Timberman*, March, 1921.—In Sweden the large timber owning companies operate their own sawmills and pulp mills and employ an efficient corps of trained foresters who are in complete control of the vast timber holdings. Only selection cuttings and thinnings are permitted. The amount of cut is limited by law. In the manufacture of matches aspen has previously been used largely, but owing to the depletion of supplies, substitutes have had to be found, of which birch is one of the most important. The Swedish people thoroughly appreciate their forest assets, and in this feature may be found the correct reason for the importance of their country throughout the world as a producer of wood goods.—C. L.

Work of the Quebec Forest Service.—G. C. Piche, *Canada Lumberman*, March 15, 1921.—The timber cut in Quebec on private lands is now almost as great as on crown lands. Crown timber revenue for the fiscal year ending June 30, 1921, will, it is predicted, reach $3,500,000. Forecasts closer regulation of cutting operations by government foresters. Need for an extensive program of reforestation and for increased efficiency in forest protection—C. L.

Statistical Survey of the Lumber Industry of Canada for Calendar Year 1919.—*Canada Lumberman*, March 15, 1921.—Summarized from report of the Dominion Bureau of Statistics.—C. L.

What Wireless Telephony Means to Canadian Lumbermen.—Douglas P. Coates, *Canada Lumberman*, March 15, 1921.—C. L.

Halt Must Be Called on Export of Pulpwood.—Frank J. D. Barnjum, *Canada Lumberman*, March 1, 1921.—Advocates restrictions on the export of pulpwood cut from privately owned lands in Canada, in view of rapidly diminishing supplies of Canadian pulpwoods. Emphasizes heavy damage by fires and by insects and need for greater conservation of our forests.—C. L.

Timber Gives Permanency to Many Activities.—Robson Black, *Canada Lumberman*, March 1, 1921.—C. L.

Economic Importance of Jack Pine in the Pulp and Paper Industry.—T. J. Dickinson, *Canada Lumberman*, February 15, 1921.—Emphasizes the availability of jack pine for news print manufacture and the large supplies of this timber available. "It is now an established fact that jack pine cooked alone will make a news print product equal to the best that has been coming from the Canadian mills."—C. L.

Research Facilities for Lumberman.—*Canada Lumberman*, February 15, 1921.—Advocates the establishment of a Division of Lumber in the Forest Products Laboratories of Canada. There are many problems which require solution but for which the existing staff of the laboratory is inadequate.—C. L.

Test for Unbleached Sulphite and Sulphate Fibers.—R. E. Lofton and M. F. Merritt, Bureau of Standards, Washington, D. C. *Technical Association Papers*, Series III, No. 1 (Dec. 1, 1920).—The difficulties to be overcome in developing a method for distinguishing between unbleached sulphite and sulphate pulps are due to the similarity of the pulps. Since the raw materials from which these pulps are made is in general the same, the only distinguishable difference between the pulps are to be found in the two different digesting processes employed in their manufacture. According to Schwalbe and others there are two differences between them which may be used as a basis on which to develop reactions which will differentiate them—viz.: (1) the difference in the amount of incrusting or ligneous material, and (2) the different chemical changes which have been brought about by the different digesting processes. The various methods proposed by earlier experiments are reviewed; Klemm's method (staining with malachite green, and then with rosaniline sulphate), Schwalbe's methods (staining with ferric chloride and potassium ferrocyanide, and staining with a copper salt and an organic dye), and Fannon's methods (staining with an aqueous solution of rosaniline sulphate to which is added 1 to 3 per cent of alcohol and enough sulphuric acid to cause the solution to take on a violet shade, and examining either with the unaided eye or with the microscope). The method proposed by the authors consists in staining with malachite green and basic fuchsine (magenta). The stain is prepared from one part of 2 per cent aqueous solution of malachite green and two parts of 1 per cent aqueous solution of

(*Continued on page 64*)

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(*Continued from page 62*)

basic fuchsine, and is mixed fresh a short time before using (not over a few hours). Owing to variations in the quality of dyes from various sources, after the stain has been made up it is necessary to test it out on authentic samples of sulphate and sulphite, and the relative proportions of the two solutions adjusted in consequence. Sulphate fibers should have a blue, or blue-green color, and if any of them appear purple there is too much fuchsine in the mixture and a little more malachite green should be added. All the sulphite fibers should have a purple or pink color, and if any of them show green or blue there is too much malachite green and more fuchsine solution should be added. The method of preparing the samples and applying the stain is as follows: the sample is boiled in water or 0.5 per cent of caustic soda and shaken thoroughly in a test tube. Several fibers are placed on a microscope slide, dried with hard or filter blotting paper, 2 or 3 drops of the compound stain added, the excess removed with hard filter paper after 2 minutes, 3 to 4 drops of dilute hydrochloric acid (1 Cc. concentrated HCl to 1 liter of distilled water) added, the excess removed with filter paper after about 10 to 30 seconds, 3 to 4 drops of distilled water added, and the excess removed. If the excess of stain has not been all removed the washing with water must be continued, otherwise the cover glass may be put on. During the whole of the preceding treatment on the slide, the fibers are continually teased with the needle to insure thorough contact with the various reagents. The color contrast not only enables one to detect the presence of one or both of these fibers, but is sharp enough to enable one, after some practice, to make an approximately correct estimate of the percentages of each of the fibers present. Results obtained on several known mixtures by three different analysts with four different makes of American dyes are given. —A. P.-C.

Preparation of Paper Pulp from Sugar Beets.—*Bull. Synd. Fab. Papier et Carton,* xxii, 349-50 (Dec. 1, 1920).—The pulp remaining after the extraction of the sugar is treated with lime water or other alkaline liquor, heated for half an hour to 80 to 100° Cent., and drained. If the pulp still has an acid reaction, it is subjected to a second alkaline treatment. The pulp is washed thoroughly, subjected to the usual mechanical treatment, and bleached. With 1 to 2 per cent of available chlorine a cellulose is obtained which is suitable for the preparation of nitrocellulose. For the manufacture of cardboard, it is sufficient to bleach the pulp with SO_2. The raw material should be treated as soon as possible after it comes from the diffusers.—A. P.-C.

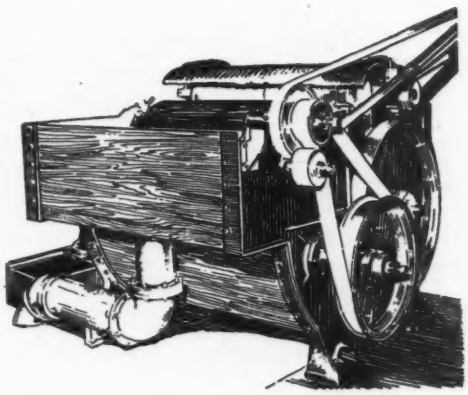
Fire Prevention in Pulpwood by Means of Artificial Fog.—F. J. Hoxie, Boston, *Paper,* xxvii, 15, 13-9 (Dec. 15, 1920); *Pulp and Paper,* xix, 5-7 (Jan. 6, 1921), 37-9 (Jan. 13, 1921).—A large log pile fire presents an exceptionally difficult problem in fire protection and engineering, in that many times as much quick-burning fuel is present in a concentrated mass as is found in any form of building in which fires are commonly fought. The absence of walls and the exposed position and height of the log pile cause ideal draught conditions, so that the rate of combustion is ultimately limited by the velocity at which air for combustion can be carried away. If a fair-sized pile should become ignited, there is practically no chance of mastering the fire after the first 10 to 15 minutes; and in such a case the best that can be hoped is to prevent it from spreading to other piles. The rate of combustion in fires of this nature is generally in the neighborhood of 25,000 to 30,000 per minute, liberating enough heat to evaporate about 25,000 to 30,000 gallons of water a minute. The wood may be protected in two ways: by making several separate piles, so that if one of them should become ignited the others may be protected; and by keeping the surface of the wood continually moist so as to prevent it from becoming ignited. The former method is more costly but may be employed when the quantity of wood handled is not too large. It is especially worth considering for the manufacture of chemical pulp from dry wood. In the case of very large piles the second method seems to be more promising. The method consists in spraying the pile with sufficient water to maintain the air in the immediate neighborhood of the pile saturated and the wood in the pile continuously wet. It has been calculated that about 60 gallons per minute ought to be enough, even in August weather, for a 10,000-cord pile. A permanent system which suggests itself as highly practicable where fixed conveyors are in use, is to attach half-inch pipe to steel cables from the conveyor to the ground at a sufficient height above the pile to prevent damage from the falling logs, the pipes being spaced about 20 ft. apart along the conveyor with heads about 30 ft. apart along the cables, these heads discharging half-a-gallon a minute each. Experiments are now under way at six large paper mills at least on the use of spray nozzles the object being to determine the most effective spacing arrangements of piping and capacity of heads. Results thus far indicate that 2-qt. heads as manufactured by the Spray Engineering Company, spaced 30 ft. each and elevated 5 ft. above the surface of the pile, will give satisfactory service with a pressure of 50 to 70 lb. at the head. Half-inch branch pipes feeding 5 to 8 heads appears to be large enough. The main feed pipe should be large to supply monitor nozzles and to keep down the water velocity to prevent keeping sediment in suspension, which would clog the nozzles. Both methods of protection against fire have the further advantage of protecting the wood against decay also. The decay of wood is due to bacterial action, and the organisms require a certain amount of moisture to develop. If there is either insufficiency or excess of moisture they cannot develop, so that the protection of the pile against decay is obtained by keeping the pile either too wet or too dry for the organisms to develop properly.—A. P.-C.

Facts About Present Costs of Manufacturing News Print.—*Pulp and Paper,* xix, 9-10 (Jan. 6, 1921).—A review of the principal factors which affect the price of news print paper, including pulpwood, labor, transportation, mill supplies, losses and risks, showing that the economic readjustment which has been manifested in other industries is not yet evident in news print manufacture.—A. P.-C.

The Manufacture of Waste Paper.—*Pappen- und Holzstoff-Zeitung* (Nov. 25 and Dec. 2, 1920); *Pulp and Paper,* xix, 36 (Jan. 13, 1921).—A rather brief description of certain machines and processes for the reclaiming of waste papers. (German patents No. 230,021, 316,469, 312,618).—A. P.-C.

Beating—Today and Tomorrow.—W. B. Campbell, *Pulp and Paper,* xix, 65-7 (Jan. 20, 1921).—Brief historical sketch of the hollander. Numerous attempts have been made to improve beaters, but with the exception of the jordan, they have all gone to the scrap heap. The outstanding feature of the ordinary beater which has kept it in use so long is the facility with which it can be used to secure any desired result. The better known improvements to the hollander are the Rabus, Marx, and Niagara beaters, lava rolls and the jordan refiner. The latter is taking the place of the beater to an ever-increasing extent but it is unlikely that it will ever replace it entirely. Further improvements will likely be in the direction of increasing the speed of circulation of the stock and the rubbing surface by means of which hydration of the stock is obtained. By the use of a lave stone lining for the hood, and by bringing down the hood of the roll so as to return the stock immediately to the working space between the roll and the bed-plate, the work of the beater might be done so quickly that the

(*Continued on page 66*)



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Canadian Ingersoll-Rand Co., Ltd., 260 St. James St., Montreal, Canada

THE BIRD SAVE-ALL

88-167

CURRENT PAPER TRADE LITERATURE

(*Continued from page 64*)

heater could be made continuous, the control being affected by adjusting the flow of stock to and from the beater. The recent researches of Miss Minor on the mechanism of beating are briefly summarized (see *Pulp and Paper*, xviii, 300, A-15, March 18, 1920; 496, A-15, 497, L-5, May 6, 1920). Results of Kress and MacNaughton at the Forest Products Laboratory, Madison, Wis., and of unfinished experiments being carried out at the Forest Products Laboratories, Montreal, Canada, tend to show that the production of a beater, other things being equal, is in proportion to the weight of fiber which passes under the roll per min.; and that in any one beater the production per hp. is constant over a considerable range of consistencies.—A. P.-C.

A Rapid Method of Control Analysis of Sulphate Liquor.—G. K. Bergman. *Finsk Pappers-Och Travarutidskrift* (Nov. 15, 1920); *Pulp and Paper*, xix, 11-2 (Jan. 6, 1921).—Sulphate liquors contain Na_2CO_3, NaOH, Na_2S, and small quantities of sulphite and silicate of soda, which can generally be neglected. An alkalimetric titration with methyl orange as indicator gives:

1. $Na_2CO_3 + NaOH + Na_2S$

while with phenolphthalein as indicator we have

II. $\frac{1}{2}Na_2CO_3 + NaOH + \frac{1}{2}Na_2S$

An iodometric titration gives

III. Na_2S.

And an alkalimetric titration with phenolphthalein as indicator, after addition of an excess of barium chloride to precipitate the carbonates, gives

IV. $NaOH + \frac{1}{2}Na_2S$

If *a*, *b*, *c*, *d*, are the volumes of standard solutions required for the titrations I, II, IV, and III, respectively, we have from I, II, IV

$$Na_2CO_3 = 2(b-c)$$
$$NaOH = 2b-a$$
$$Na_2S = 2(a-2b+c)$$

From I, II, and III we get

$$Na_2CO_3 = 2(a-b)-d$$
$$NaOH = 2b-a$$
$$Na_2S = d$$

From I, III, and IV, we get

$$Na_2CO_3 = a-c-\frac{1}{2}d$$
$$NaOH = c-\frac{1}{2}d$$
$$Na_2S = d$$

The presence of silicate and of sulphite of soda introduces an error; but a correction can be applied by determining these separately by one of the known methods. The use of I, II, and IV has the advantage of requiring but one standard solution. Most of the mills merely determine the "causticity," i.e., $\frac{100b}{a}$.—A. P.-C.

Process for Making Bright White Groundwood Pulp.—*Papier Markt* (Dec., 1920); *Pulp and Paper*, xix, 12-3 (Jan. 6, 1921).—The wood is subjected simultaneously to the action of a temperature of 100° Cent. and to a hydraulic pressure which may be as high as 10 to 13 atmospheres. When the pressure is lower, the time of the treatment must be lengthened. According to German patent No. 280,717, the wood is treated for several hours with hot water under pressure at a temperature of 100° Cent. or less; and according to German patent No. 315,679, it is treated with water at 80° Cent. under a slight vacuum so that the water is continually boiling. The wood treated by any of the above methods, it is claimed, is much whiter and easier to grind.—A. P.-C.

News of the Boston Paper Trade

BOSTON, Mass., June 6, 1921.—Stone & Andrew, Inc., have taken on new cover lines and are now exclusive New England distributors of "Enameline," known as "Coated's Best Rival" and manufactured by the Peerless Paper Company of Dayton, Ohio.

The new lines are Rexford enamel, described as a No. 1 coating on a rag content sheet, excellent folding and printing qualities; Patrician cover, a distinctive pattern and two side deckle cover stock, and Collins No. 1 bond, said to be the equal of any bond on the market made from pure white rag stock.

Jacob L. Barowsky, well known in the paper trade as general manager of the Connecticut River Paper Company of Holyoke and Boston, has entered business for himself and is conducting the business of the Beacon Pulp and Paper Company with offices at 27 School street, Boston. He will cater to jobbers, converters and publishers, and represent a number of paper mills. He has had long experience in the paper business. The Boston trade has already extended him a welcoming hand, wishing him success and prosperity.

Light weight papers are being featured by the Charles A. Esty Paper Company of Worcester and Boston, which has recently become New England distributor for a mill peculiarly adapted to the manufacture of light weight book papers and both white and colors.

Chester M. Clark, formerly head of the Corporation Department of Stone & Webster, Inc., and during the war Secretary of the underlying company at Hog Island and assistant to Mr. Matthew Brush, the president of that corporation, has been elected Treasurer of Arthur D. Little, Inc.

Merton R. Sumner has been appointed Chief Engineer of Arthur D. Little, Inc., chemists, Engineers & Managers, Cambridge 39, Mass. Mr. Sumner was formerly chief engineer for New England of Fred T. Ley & Co., Inc., in charge of about 125 construction projects and more recently was chief engineer of the Fuller Industrial Engineering Corporation, a subsidiary of the George A. Fuller Company.

Pulp Land Sold

WINNIPEG, Manitoba, May 31, 1921.—An order-in-council recently signed provides for offering for sale a large pulpwood area covering certain Dominion and school lands in Manitoba, east of Lake Winnipeg. The total available area is about 720 square miles. It is required that the purchaser engage with the Minister of the Interior to erect within the limits a pulp and paper mill costing, with equipment and machinery, not less than $1,000,000, and operate the mill to produce a daily output of not less than one hundred tons of pulp.

Paper Mill Supply Man Dies Strangely

The body of Samuel G. Fernbacher, dealer in paper mill supplies, with offices at 22 Jones street, was found on Tuesday in a water tank on top of the building in which he had his place of business. His throat was slashed and his right wrist cut. Although the police attribute his death to suicide, near relatives and friends say that they can think of no reason for his taking his own life. Mr. Fernbacher is said to have had a considerable amount of money on his person when he left home on Sunday and all of this was not recovered with the body.

Standardize

your requirements for Grease-proof paper on tested quality.

The well-known brands Purity and Berkshire will meet all requirements a high grade Grease-proof paper is subject to.

Many of the largest paper distributers of the country have standardized on Mountain Mill products.

Why don't you?

We will be glad to mail you a full line of samples.

Mountain Mill Paper Co.

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PAPER

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We endeavor to establish a closer relationship between mill and jobber or converter on the basis of *permanent connections* rather than transient sales.

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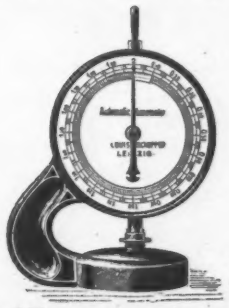
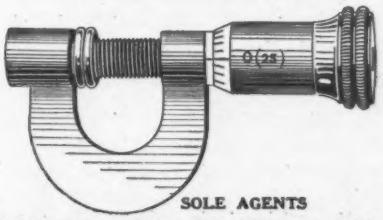


8" wide

Pocket Micrometer, Actual Size



SOLE AGENTS

FOREIGN PAPER MILLS, INC.

261 BROADWAY NEW YORK

PAPER CONCERNS CONDUCT RESTAURANTS

The high cost of living problem has been solved and equally valuable savings in time effected, by two Philadelphia paper institutions, both nationally known. The D. L. Ward Company operates self-sustaining but highly money saving restaurants in its big warehouse at Front and Federal streets and in the basement of headquarters at Sixth and Ludlow streets, while the Dill & Collins Company likewise conducts cafeterias in the Delaware Mill at Richmond and Tioga streets and in its home offices at 6th and Cherry streets. Though these institutions have been in operation for but a short period, their success is certain; they are patronized, voluntarily, by over 95 per cent of the officials and employees for whom they were provided.

Restaurant at Ward Co. Headquarters

The most completely appointed and largely patronized of these eating places is in the basement of the Ward headquarters. Designed primarily for the office force it has a larger appeal because printer and other customers happening in the neighborhood at the noon hour find it a most convenient rendezvous. The pocketbook is but slightly taxed, a saxing of from fifty to seventy-five per cent is effected and time too is saved. Even executives of competing houses like Morgan H. Thomas of the nearby Garrett-Buchanan Company occasionally enjoy the facilities of the restaurant. All are welcomed although the lunch room is conducted with no desire to make a profit and solely for the Ward workers, their customers and their friends.

Initial Investment $6,000

The initial investment for equipment aggregated about $6,000. It was made by the Ward Company. Heat, light and rent also are donated. Best of all, President George W. Ward arranged with a family cook to conduct the establishment. Finally a fund of $1,000 was placed at the disposal of General Manager Parker as capital with the understanding, however, that it was to be repaid when restaurant finances permitted. Mr. Parker is giving his time to buying and his assistant is volunteering as cashier during the rush hours from noon till one o'clock.

The cafeteria has a seating capacity for 84 and is open every day, serving hot cooked or roasted foods during the week days save Saturday, when only sandwiches and light lunches are provided. It is equipped with gas range, commodious icebox and in fact all the paraphernalia of the most up-to-date eating establishment.

The surroundings are attractive; the menu and attached prices even more so. Roast turkey with cranberry sauce in liberal portion are to be had for 30 cents; soup for 5 cents, ice cream for 6 cents, roast sweet potatoes for the same, coffee, tea or milk for 5 cents. These, however, are but typical prices; the menu is changed daily.

How popular the restaurant is, is attested by the fact that the average attendance is now over 98 per cent of the employees, from president to office boy in the headquarters. Their average expenditure for a full dinner is a little over 30 cents; the saving in actual money is at least this amount, often more as compared with prices for a like repast in purely commercial eating places.

Inspiration for the headquarters restaurant came from the lunchroom which was provided for the employees of the Federal street warehouse.

Dill & Collins Co. Restaurant

The Dill & Collins Company like the Ward Company provided a restaurant at the mill as a real necessity; at the headquarters as a great convenience. These two eating places too are conducted merely on a self-sustaining basis—evidenced by a typical menu: Hamburg loaf and potatoes, or cold ham and potato salad, bread and butter, tea, coffee or milk, 25 cents; pepper sauce, 5 cents; blackberry rolly polly, 10 cents; ice cream, 10 cents.

To Hold Forestry Meeting in Chicago

[FROM OUR REGULAR CORRESPONDENT.]

WASHINGTON, D. C., June 6, 1921.—A conference bringing together representatives of many of the various interests concerned with forestry problems will be held at Chicago, June 13 and 14 by the National Forestry Policy Committee of the Chamber of Commerce of the United States.

In making this fact public today the committee announced that it would seek to obtain every viewpoint before proceeding to formulate a national forestry policy.

"The object of the committee," said D. L. Goodwillie of 651 Otis Building, Chicago, the chairman, today, "is to study carefully the several economic phases that have to do or should have to do with the promotion of forestry. We have begun under ten headings with sub-committees for each group. The subjects under consideration by the groups are: government regulation, private holdings, individual versus public rights, fire protection and expenditures, acquisition of land, national forestry survey, taxation, utilization of wood and forestry conservation, reforestation, national forests.

"On completion of its work the committee will make a report to the Chamber's Board of Directors. If the recommendations of the committee are considered by the Board to be of sufficient national importance the Board can order them sent to a referendum vote of the Chamber's membership. The results of referenda are laid before Congress and the proper government departments as expressing the views of the Chamber.

"This district not only has the bulk of the remaining timber in the United States, but the trees are so large and the stands so dense that logging conditions are vastly different from those of other sections. In justice to the operators of this region as well as to the lumber users of the rest of the country, the Committee feels that it should make a study on the ground."

Dr. Hugh P. Baher, secretary of the American Paper and Pulp Association, is a member of the committee.

First Paper Mill in Canadian Prairie

OTTAWA, Ont., June 6, 1921.—The first paper mill in the Canadian prairie Provinces has been arranged for by granting the tend of 780 square miles of pulp forest east of Winnipeg to J. D. McArthur, head of the Manitoba Pulp and Paper Company. The grant is conditional on the expenditure by the company on the plant of $1,500,000 in three years. It is expected, however, that the paper mill when completed will have cost nearly $5,000,000 and that it will be one of the largest in Canada.

The mill will have an immediate capacity of 100 tons of pulp a day, and of this 50 per cent must be converted into paper in the plant. If the needs of the three prairie Provinces require it, the Federal Minister of the Interior may direct that a larger percentage be manufactured into paper at the plant.

The pulp and paper industry, despite the difficulties affecting one or two companies, continues to thrive, and this new development is symptomatic of the favorable condition in which the industry is at the present time. The district near Winnipeg has experienced a remarkable development in the last two years.

Signs of Better Times at Holyoke

[FROM OUR REGULAR CORRESPONDENT.]

HOLYOKE, Mass., June 6, 1921.—The Wauregan division mill of the American Writing Paper Company re-opened today after a week's shutdown. Officials of the company state that there is every indication of a decided pick-up in the paper making industry. E. H. Frank, formerly manager of the payroll and employment department of the company, has been transferred to the service department of the Chicago office of the company.

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PAPER MAKERS TWINE TUBE ROPE
WALL PAPER TWINE HAY ROPE
FINE AND COARSE POLISHED TWINES
"AMERICAN" BRAND MANILA ROPE
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Largest Makers of Commercial Twines and Rope in the World

AMERICAN MANUFACTURING CO.

NOBLE AND WEST STREETS, BROOKLYN, NEW YORK CITY

CORDAGE

New York Trade Jottings

The New York warehouse and sales department of the Continental Paper and Bag Mills moved, June 1, to its new building at Dominick and Clark streets.

* * *

Warren B. Bullock, director of the Department of Information of the American Paper and Pulp Association, is out of town for a short time on a business trip to Washington.

* * *

The Kenilworth Paper Company has opened offices at 316 West 30th street and will specialize in coarse papers. An especially high grade of kraft will be handled under the trade mark "Kenilworth."

* * *

A petition in bankruptcy has been filed against the Gotham Paper Stock Company, Inc., of 525 Broome street, by these creditors: Sterling Paper Stock Company, $250; L. Gross, $148; Anthony Donadio, $1,091. An assignment was also made to Benjamin Abrams.

* * *

R. S. Kellogg, secretary of the News Print Service Bureau, spent a few days in Washington last week with a committee from the American Association Trade Executives. It is understood that this committee has been formed to act in co-operation with the Chamber of Commerce of the United States. Mr. Kellogg returned to Washington on Tuesday, but is expected back in his New York offices in a few days.

* * *

Don Marquis, the Grand Old Man of the newspaper "colyumnists," appears to have taken up the cudgels for preservation of the natural resources of the nation. In the Sun Dial in the New York *Sun* last Monday, under the title of "The Almost Perfect State," he makes a plea for reforestation, setting forth in his inimitable and vivid style the dire consequences of reckless cutting. A situation must indeed be serious to be taken seriously by a "colyumnist."

* * *

Main Paper Stock Company, Inc., at 25 Spruce street, has filed schedules in bankruptcy, with liabilities of $514,620, represented by taxes due in the United States, $75,000; wages, $1,500; secured claims, $206,744; unsecured claims, $231,346, and assets of $463,956 main items of which are real estates, $13,958; bills, promissory notes and securities, $34,773; 13 horses, $4,500; autos, wagons and trucks, $21,456; other personal property, $164,445; accounts, $86,307; stocks, bonds, etc., $61,939; policies of insurance, $4,000; unliquidated claims, $64,393; deposit in bank, $2,234. Secured creditors are Gaurini & Candela, $30,800; East River National Bank, $47,906; William Schall & Company, $32,363, and Finance Trust, $95,704.

Strike May Be Settled Soon

Hope for a speedy settlement of the news print strike has been expressed with increasing frequency during the past week and one of the most significant moves toward an adjustment was taken by the International Paper Company when it sent a communication to each of its employees asking them to return to work on the basis of the 1919 wage scale.

As soon as a sufficient number of men have signified their intention of returning, the letter states, mills will again be put into operation. The twenty-five mills operated by International have been closed down since May 1, last, which entailed a loss of production normally of 25,000 tons of news print.

However, just before the beginning of the strike, mills were running on a reduced schedule so that actual loss of output as a result of the strike will not reach the 25,000 tons normal production during May.

Just what the return to the 1919 scale will mean in dollars could not be learned from International Paper Company as officials are out of town. The agreement which expired May 1, last, represented a twenty per cent advance over the 1919 scale which went into effect May 1 of that year.

International Paper Company has practically withdrawn from the Committee of Manufacturers, announcing its intention to take up the matter separately with the men, but it is quite likely that in the event of settlement by arbitration by the other companies, that it would recognize the basis of settlement and make similar adjustments with its men.

Wage agreements of the various companies expired May 1, and 13, last. The strike which has been in effect since then involves approximately 20,000 employees and affects about seven-eighths of the production, capacity basis, of the mills here and in Canada. Capacity production of the two countries is estimated at about 8,000 tons of news print. Lacking official figures, it is believed about 1,000 tons of print paper is now being produced here and in Canada. April output of this country was 115,408 tons of news print.

From the viewpoint of the consumers of print paper, the beginning of the strike last May saw the industry in the best position in more than five years to withstand a loss of output. Stocks on hand, mostly in the hand of publishers, were estimated to be enough for slightly more than two months' needs but stocks have been depleted considerably since May 1. For two years up to the middle of 1920, papers had been practically on a hand to mouth basis.

International Reduces News Print Price

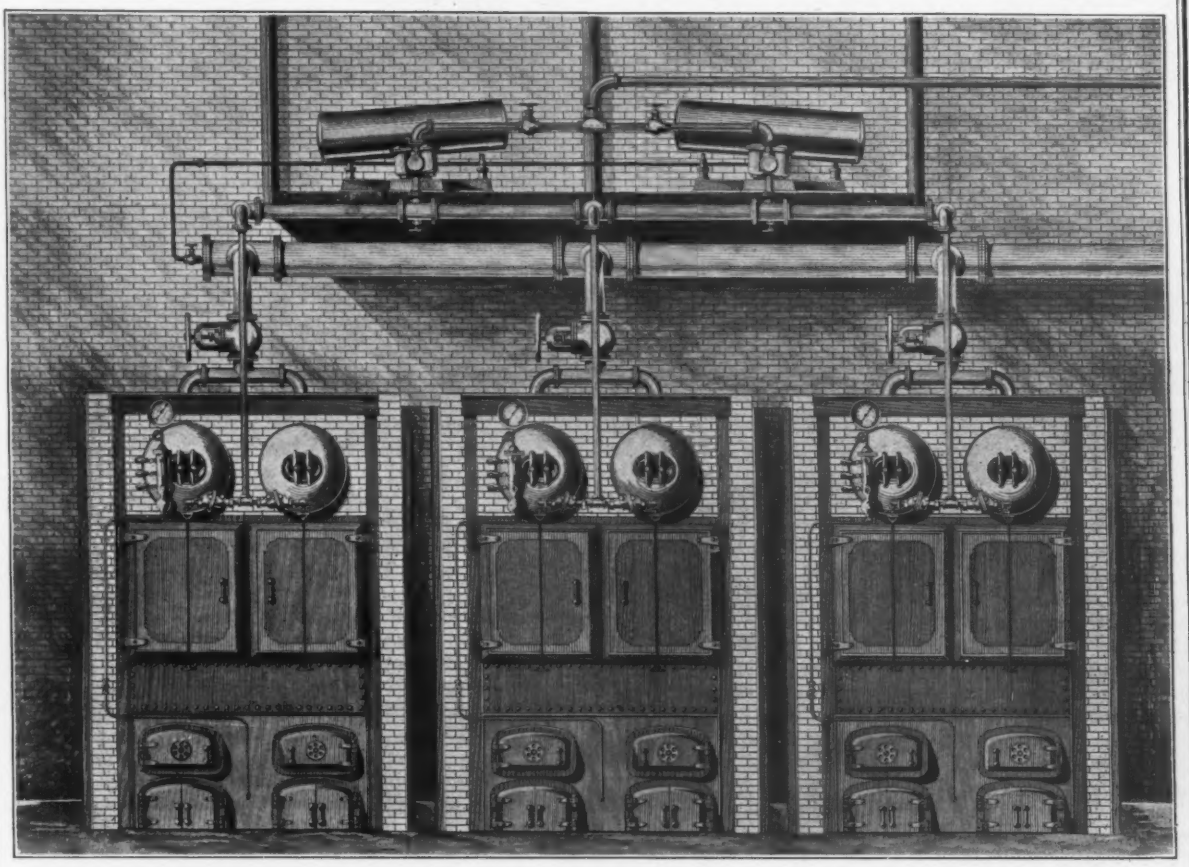
The International Paper Company has announced another reduction in the price of news print paper in carload lots, covering the third quarter of the year. The new rate is 4¼ cents a pound compared with 5½ cents in the previous quarter, the reduction being equivalent to from $110 to about $95 a ton. A peak price of $130 was quoted during the last quarter of 1920 and the first quarter in this year. The new schedule is still $5 a ton above the first quarter level of last year.

P. T. Dodge, president of the International Paper Company, commenting on the reduction, said that this action was taken despite the fact that the cost of production for the third quarter of the year would be higher than that of the second quarter, and that the purpose was mainly to conform with the readjustment going on in business in general. Not only will the cost of labor continue high, according to present indications, says Mr. Dodge, but the cost of materials are high, for the International is consuming products contracted for at the peak of prices, being forced to contract for supplies from eighteen to twenty months before they are used.

The labor costs per ton of paper, he said, have increased from $8.26, before the war, to $22 a ton now. This item includes only wages paid at the mills and does not take into consideration employees outside of the mills. Besides this increased cost, there has been a decrease in the efficiency of the men, the output of paper per man amounting to only 69 tons per year, against 80 tons normally.

The question of freight rates is also a factor in the high costs of producing paper. Mr. Dodge says that the freight charges per ton have increased $9.60 in five years. Another factor adding to costs is the movement of freight cars. The International, during the period of Government control of the railroads, when cars were scarce, was forced to purchase 500 freight cars. These cars are used to transport the supplies and production a distance in some instances of about 600 miles. The cars cannot be loaned to other industries, so they have to be hauled back empty.

Save Coal by Returning All Condensate Direct to Boilers



The Farnsworth Closed Loop Boiler Feeding System

Save the valuable heat units contained in the condensate from your high and low pressure steam lines. Let a Farnsworth Closed Loop Boiler Feeding System equipped with

Farnsworth Duplex Boiler Feeders

handle all the condensate at a saving in coal, time and trouble.

The Farnsworth Machines are placed above the boilers to allow the returned condensate to enter the boilers by gravity, insuring a steady feed under a uniform head.

Positively automatic in operation. No lubricating oil or attention is required in service. Made in capacities ranging from 100 to 1000 hp. Tested to 300 lb. before leaving the shop.

Especially adapted to feed condensate into very large batteries of boilers.

The duplex feature, meaning that each machine has a double chamber, so that one chamber is filling while the other one is emptying, providing a continuous flow to the boilers.

The feed control to individual boilers is the same as with steam pumps.

Consider the saving that results from the fact that the condensate reaches the boiler near steam temperature instead of being cooled down to below 212° F., merely to accommodate a pump. Then add the steam saved in operating the Farnsworth Machine, which uses only 10 per cent of the steam consumed by a pump to do the identical work.

The Farnsworth Forced Steam Circulation System for Paper Mills is a Proven Success

Our engineering department would be pleased to advise you regarding the application of this system to your plant. Write us for latest Catalog now.

Farnsworth Company, Conshohocken, Pa.

Canadian Farnsworth Co., Toronto, Canada

PAPER DEMAND IN TORONTO IS GOOD IN THE AGGREGATE

While Individual Orders Were Small, the Past Month Taken as a Whole Was Fairly Satisfactory—No Talk of Price Changes Is Heard at Present and Jobbers Are of the Opinion That the Tide Has Turned and That the Worst of the Depression in the Paper Business Is Over—Spruce Falls Co. Is Making Satisfactory Progress on Its New Sulphite Mill at Kapuskasing, Ont.

[FROM OUR REGULAR CORRESPONDENT.]

TORONTO, Ontario, Canada, June 6, 1921.—There is an old Scotch saying that "many mickles mak' a muckle" and the wholesale paper trade in Toronto believe that this is true. All dealers report that the past month was a very good one as the number of small orders was unusually large and mounted up to a very respectable total; in fact, much better than many of them expected. This was no doubt caused by a number of concerns freely buying supplies during the last week in May in preparation for the printers' strike. A mass of work in the printed line was rushed out by the commercial printing establishments for customers during the last few days which consumed a large quantity of paper of all kinds.

One large wholesale paper firm is starting an advertising campaign in the line of direct mail order publicity to push "Made-in-Canada" papers and declares that any class of paper desired is now manufactured in the Dominion. Manufacturing stationers report that there is a good demand for standard lines and some jobbers are of the opinion that the tide has turned and the worst of the depression in the paper business is now over. No talk of price changes is heard at present and the feeling seems to be that quotations have about touched bottom. At any rate, it is not expected there will be any radical change in any range with the exception of news print, for some weeks as prices are now very near, in many instances, to pre-war figures.

For the first time in a long period dealers report a change in conditions governing the rag and paper stock market. There are more requisitions than for several weeks, but buying is as yet cautious and limited in quantity and for immediate requirements, as many mills are only operating part time. In domestic rags, there is some demand for new cotton cuttings from United States mills, but prices have shown no advance. Canadian plants are still running slowly and are not purchasing heavily. Manila rope is in fair demand at four cents a pound and No. 1 old whites are selling at four cents.

An era of better things has set in in the pulp line, but business is not yet brisk, although the movement is a little freer. Board mills in Ontario are now operating six days a week and paper box factories report some improvement in trade, but not one is running to capacity. From this out manufacturers and wholesalers expect that trade will not get any worse and as soon as all labor troubles at the mills and in the various printing establishments are settled, there may be a distinct improvement, although no predictions are made. There have been numerous inquiries for fairly large tonnages of mixed papers during the past few days.

Spruce Falls Mills Nearing Completion

The Spruce Falls Company of Neenah, Wis., which is erecting a sulphite mill at Kapuskasing, Ont., reports that the work of installing the equipment is going on apace. It is expected the plant will be ready for operation about September 1. A large force of men is at work, but there is no particular rush to justify putting much pressure on the completion of the plant, owing to the present and prospective state of the sulphite market and conditions in general. The rossing department of the plant will go into commission early next month so as to insure the completion and rossing of the pulpwood of the company before cold weather sets in next fall. The present stock of pulpwood is between 65,000 and 75,000 cords. The Spruce Falls Company says that on the construction of the groundwood mill and water power plant it has not resumed operation and it is not likely it will do so before the end of the year unless conditions materially improve. It developed a small water power at the mill site yielding about 1,200 horsepower with which it expects to operate the sulphite mill until its Sturgeon power development is undertaken and completed. The company has also installed as part of its sulphite equipment a steam turbine of ample capacity to operate the mill, which will have 120 tons daily capacity in case of water power failure. This was part of the original plant of the company and was installed as a sort of standby power to take care of any requirements during periods of low water.

Spanish River Co. Cuts Price

The Spanish River Pulp and Paper Mills, Sault Ste. Marie, Ont., have announced that their price for news print in rolls will be $95 per ton, f. o. b. mills from July 1, next. This is a reduction of $15 per ton from the present figure. It is said that similar announcement may be expected from other companies during the next few days. The strike in the mills has not yet been settled, but a definite agreement on wages is looked for by both employers and employees within a week or ten days.

Minimum Wages for Female Labor

The Minimum Wage Board of Ontario has under order known as No. 4, fixed the minimum wage which must be paid by employers of girls in paper box factories, envelope factories and those establishments making envelopes, stationery, tags and check books. The schedule is as follows: Experienced adult, $12.50 per week; inexperienced adult, first six months, $10 per week; young girls, first six months, $8 per week; second six months, $9 per week, and third six months, $10 per week. The number of inexperienced adults or girls in any establishment shall not exceed one-third of the total female working force, nor the number of inexperienced adults and girls together exceed one-half of the total female working force. The employers have agreed to the schedule.

Work Starts on Two New Plants

Work has started on the new, fifty ton groundwood pulp mill which will be erected at Dixon's Creek near Haileybury, Ont., on the shores of Lake Timiskaming. The company, which is putting up the plant, is the Timiskaming Pulp and Paper Company, of which Alex Faskin of Toronto is president. Excavation for the buildings is now well under way.

A beginning will be made in a few days in rock excavation for the new book paper mill which will be erected at Port Arthur by the Provincial Paper Mills, Limited, Toronto, of which I H. Weldon is president and S. F. Duncan, secretary-treasurer. The foundation of the new structure will be completed this fall and work on the superstructure and equipment go ahead next year. The mill will be a two machine one, and the first unit will have an output of twenty-five tons a day. The Provincial Paper Mills have for some years operated a sulphite pulp plant of sixty tons capacity at Porth Arthur, of which A. G. Pounsford is manager.

More Reforesting Stations for Ontario

Simcoe county, Ont., is acquiring a block of 800 acres in the township of Vespra for the planting of a municipal forest under the Ontario government's reforestation scheme. The land, which is valueless for ordinary agricultural purposes, is being secured at a cost of about $6 per acre. The whole block was once covered with pine, which was removed several years ago, and now there is some second growth timber upon it.

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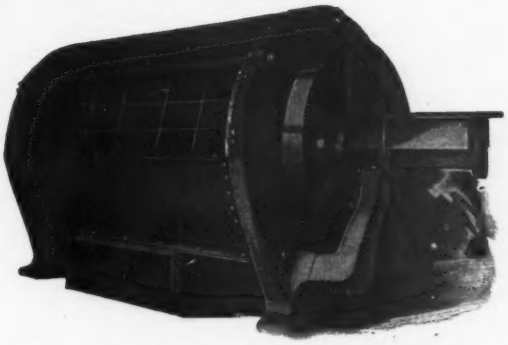
Very Low Power and Upkeep Expense



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STRIKERS RETURN TO WORK AT NORTHERN PAPER MILLS

Settlement Is Effected After Reorganization of the Company and Strike Riots in Which Two Men Are Seriously Injured—Strike at the Plants of the John Hoberg Co. and The Green Bay Paper and Fibre Co., It Is Expected, Will Be Settled Soon—High Power Transmission Line Connecting Various Divisions of the Consolidated Water Power & Paper Co. Is Completed.

[FROM OUR REGULAR CORRESPONDENT.]

APPLETON, Wis., June 7, 1921.—Striking employees of the Northern Paper Mills, Green Bay, who have been idle since about the middle of March, returned to work June 6 after accepting the company's conditions for settlement of the strike, but only after causing disturbances which resulted in appeal to Gov. John J. Blaine for troops to maintain order. Settlement of the strike followed reorganization of the Northern Paper Mills and the strike riots. Two men were seriously knifed in the fighting and it was feared one would die.

As this is written, the strike at the John Hoberg Company and Green Bay Paper and Fibre Company still was in progress but strikers had indicated a willingness to return to work on the same terms offered by the Northern Paper Mills and it was expected that a settlement would be effected speedily.

Strikers agreed to accept a wage cut of 16 2/3 per cent put into effect March 1 and also agreed that the company is not to discharge any of the persons in its employ on Saturday, May 28, to make room for strikers. Men who were idle because of the strike will be taken back as soon as places are found for them, it was agreed.

Strikers and the company agreed there shall be no prejudice against any person for participating in the strike or refusing to participate in it and any indication of ill-will growing out of the strike, either on the company's premises or elsewhere, when such ill-will operates against the efficiency of the workers, will be cause for dismissal. The present grievance committee is continued in power with the understanding that it shall give the same attention to all employees, whether organized or non-union.

One of the immediate results of the strike riots on May 31 was institution of a suit for $300,000 by the Northern Paper Mills against the city of Green Bay for failing to maintain order. This suit will not be withdrawn, it was said by company officials.

Rioting at Northern Mills

Although the strike at the Northern Mills had been in progress for about 12 weeks, the company was able to operate most of its machines with other labor but it had considerable difficulty with strikers, finally securing an injunction which restricted strikers to peaceful picketing. This injunction was violated repeatedly and the disturbances came to a head on May 31 when an immense crowd of idle men surrounded the plant and refused to permit workers to enter and even barred company officials from the property. The sheriff and a squad of deputies was overpowered and disarmed. The rioting assumed such proportions that an appeal was made to the governor for troops but the latter refused to send them after an investigation had been made.

The rioting continued for about two days. Employees in the mills, several of them away from Green Bay, were taken out of the plant by boat in order to avoid the crowd and were taken to the jail for safe-keeping until they could be paid off and sent out of town.

It was said the city commission of Green Bay took little cognizance of the strike, insisting almost to the very end that there was no trouble at the plant. This attitude and failure to provide adequate police protection so the mill could be operated resulted in the suit for damages.

In spite of the intense feeling which the strike engendered, the company's proposals for settlement were accepted by practically a unanimous vote. The terms provide for a return to work under practically the same conditions as of March 1, when the company announced a reduction in pay.

It probably will be some time before a majority of the strikers are returned to their jobs because many of the positions have been filled and business does not warrant operation of all the machines. Judson G. Rosebush, who recently subscribed for $350,000 of new stock in the company, is general manager of the concern and signed the articles of agreement.

New Power for Peshtigo Fibre Co.

Wheels of the Peshtigo Fibre Company plant now are operated by power generated in the new power house at Place Rapids, on the Peshtigo River, completed last week. This development, the largest on the river, was made by the Peshtigo Pulp and Paper Company, whose owners also control the fibre company. Only two turbines have been installed, but provision was made for putting in more wheels if requirements of the two paper companies make that necessary.

Power Transmission Line Completed

The high power transmission line connecting the Wisconsin Rapids, Biron and Stevens Point divisions of the Consolidated Water Power and Paper Company, under construction since April, 1920, has been completed. It makes it possible to transmit power from any of the divisions in which there may be an excess because of river conditions. Mill men believe the line will result in more uniform operation of the plants which sometimes have been hampered because of insufficient power.

The transmission line is seventeen and one-half miles long and is capable of transmitting 4,000 horsepower at 44,000 volts. It is independent of the line from Wisconsin Rapids to Biron. The wires cross the Wisconsin River three times, but mill officials said between three and four miles of wire were saved because the river was crossed. A private telephone line connecting the three mills also was installed.

To Manage Interlake Pulp & Paper Co.

Announcement was made during the week of the appointment of Henry A. Babcock, who has been with the Consolidated company for more than a year as manager of the Interlake Pulp and Paper Company mill in Appleton, succeeding George P. Berkey, who was transferred from Appleton to Wisconsin Rapids several months ago.

First Raft of Pulpwood Reaches Green Bay

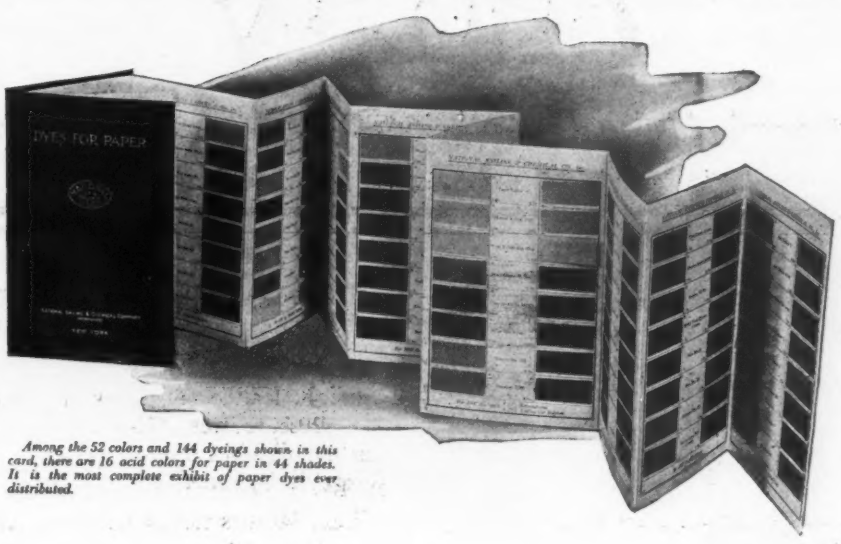
The first raft of pulpwood to reach Green Bay this season reached port last week from Big Bay de Noc, near Escanaba, and was consigned to the Green Bay Paper and Fibre Company. It contained about 5,000 cords of wood. Very little pulpwood has arrived in Fox River Valley yards the last few weeks. All the yards are filled to overflowing and little more can be taken care of.

Zellerbach Company Election

SAN FRANCISCO, June 1, 1921.—The Zellerbach Paper Co. re-elected its officers at its annual meeting. A report on the company's financial standing was not made public.

The list of officers includes I. Zellerbach, president; M. M. Cohn and M. R. Higgins, vice-presidents; A. Van der Zwiep, secretary; S. Sonnenberg, treasurer and assistant secretary; J. D. Zellerbach, H. L. Zellerbach and C. R. Crosby, assistant secretaries.

The directorate includes J. Y. Baruh, M. M. Baruh, M. M. Cohn, M. R. Higgins, H. H. Zellerbach, I. Zellerbach and J. D. Zellerbach.



Among the 52 colors and 144 dyeings shown in this card, there are 16 acid colors for paper in 44 shades. It is the most complete exhibit of paper dyes ever distributed.

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600-W

Why Gargoyle Cylinder Oil 600-W is the most widely used brand of Steam Cylinder Oil

TO lubricate your steam cylinder and valves, the following elementary facts should be kept in mind:

1

FIRST AND FOREMOST, an oil film is essential to prevent metal-to-metal contact between piston and cylinder wall and the valves and valve seats.

2

SELECTION OF THE OIL is based upon engine construction and operating conditions:

The prevailing factors are—high steam pressure and full engine load.

3

APPLICATION—The oil is introduced into the steam line.

The high velocity, high temperature steam will atomize and carry the oil to all parts. Low pressure steam will only atomize light bodied oils.

4

MAINTENANCE OF OIL FILM—In all steam cylinders some moisture is present. The oil must, therefore, be of a character to resist the washing effect of the condensed steam.

A high quality strong oil must be used to maintain an oil film under the high temperatures prevailing.

(A light loaded engine or one employing low pressure wet steam requires a high quality oil—but one of lighter body than Gargoyle Cylinder Oil 600-W).

These factors necessitate the selection of an oil that will meet the lubricating requirements of your engine with scientific exactness. Gargoyle Cylinder Oil 600-W has been doing this with complete satisfaction for over 40 years.

TODAY Gargoyle Cylinder Oil 600-W is saving money, wear and tear in steam cylinders throughout the world.

Many efforts have been made to imitate Gargoyle Cylinder Oil 600-W—even to its name. But never with success. That is why you should look for the red Gargoyle trade mark when buying any oil described as "600-W."

If you are not now using Gargoyle Cylinder Oil 600-W for your steam cylinders, the chances are that you are not securing the full economies of scientific lubrication.

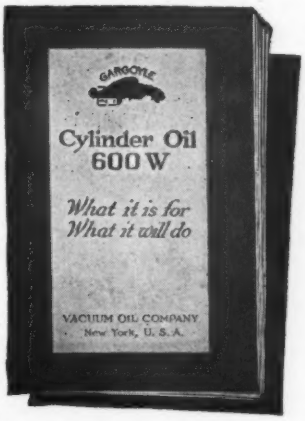
If you wish to secure steady, uninterrupted operation—and therefore production—we suggest that you get in touch with our nearest branch. Stocks are carried in principal cities throughout the country.

VACUUM OIL COMPANY

Why Operators of Steam Cylinder Engines should read this booklet

1

Tells why the physical properties of a cylinder oil are no indication of its lubricating value.



2

Explains, briefly, the main problems of efficient cylinder lubrication.

3

Shows what happens when a too-light or too-heavy oil is used, or when too much or too little oil is used, or when low quality oil is used.

4

Explains how Gargoyle Cylinder Oil 600-W insures the correct lubricating and sealing film.

5

Gives the step-by-step procedure in using Gargoyle Cylinder Oil 600-W.

6

Puts before you typical results following the use of Gargoyle Cylinder Oil 600-W.

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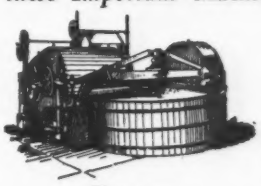
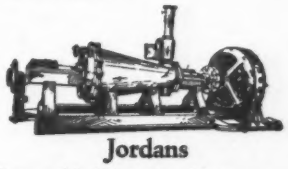


Beaters

Beater bearings, generally unnecessarily hot, will run cooler if the stock leakage is eliminated and oiling is regularly attended to. The regular use of **Gargoyle D. T. E. Oil Extra Heavy** overcomes beater lubrication difficulties.



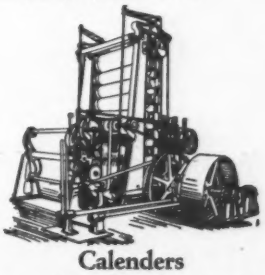
Jordans

Because of the high speeds and heavy pressures which are always present, and the side pull on bearings when belt driven, it is necessary to use a heavy bodied oil. For this purpose we recommend **Gargoyle Etna Oil Heavy Medium.**

Paper Machines

For bearings of the paper machine, subjected to induced heat from steam used for drying, an extra heavy bodied oil is required such as **Gargoyle D. T. E. Oil Extra Heavy.**

The rolls at the wet end subjected to moisture and heavy pressure demand a compounded oil which will resist the washing tendency and maintain a perfect oil film. We recommend **Gargoyle D. T. E. Oil Heavy X** for these specially trying conditions.



Calenders

Paper machine production is directly dependent upon uniform speed. Calender bearings are subjected to heavy pressures and high frictional heat. The regular application of Gargoyle D. T. E. Oil Extra Heavy insures uniform speed, and consequently minimizes "broke."

VACUUM OIL COMPANY

Editorial

Vol. LXXII New York, June 9, 1921 No. 24
FORTY-NINTH YEAR

Meeting Competition

With the present market all to the advantage of the buyers, paper manufacturers should use every possible means they have within their power to improve their equipment to meet the keen competition which has sprung up within the past year. It is probably difficult for some of them even yet to realize what a complete about-face has taken place. Fourteen or fifteen months ago anybody could start up a mill and make it pay. News print manufacturing plants sprang up, and many mills which were making other grades of paper turned to this kind as the best paying proposition. Now this sort of production is a thing of the past, and it is only the mill which has every modern facility which wins out in the fight.

R. W. Sindall, the well-known authority on the manufacture of paper, remarks in this connection: "In the case of common printings and writings, which form the great bulk of the paper made, the possibility of one mill competing against another, apart from the important factor of the cost of freight, coal and labor, is almost entirely determined by the economy resulting from the introduction of modern machinery.

"The equipment of an up-to-date paper mill, therefore, comprises all the latest devices for the efficient handling of large quantities of raw material, the economical production of steam, the minimum consumption of coal, matters which are, of course, common to most industrial operations, together with the special machinery peculiar to the manufacture of paper."

These words are especially applicable at this time and many of the manufacturers have seen the handwriting on the wall, and in spite of the difficulty which exists in procuring ready money many improvements are being made in the equipment of mills all over this country and Canada. It behooves those who still believe that what was good enough for their grandfathers is good enough for them to get into the game or they may be sadly outstripped in the race.

There is no place in the industry today for the mill which is not up to date in every respect. It is as useless as a ten-year-old telephone directory.

Solution of Credit Situation

Millions of savers are needed to supply the funds which will hasten business revival and promote general prosperity. This is the theme of a special article in the May issue of the *Bankers Magazine* contributed by B. M. Grant, Manager of the Government Loan Organization of the Second Federal Reserve District, writing under the caption "The Permanent Solution of the Credit Situation." The writer says:

The condition of world finances demands that new classes of investors be developed. Large investors may be left to themselves but it is essential that small investors be encouraged. The fact is that America has scarcely begun to show the world what she can accomplish through a well balanced program of industry, thrift, saving and investment. The whole people must co-operate with vigorous determination to accumulate capital. Wage earners can save and invest large sums of money in the aggregate—the success of the Liberty Loan campaigns demonstrated this. Thirty million workers saving an extra dollar a week for three years would release an additional $5,000,000,000 for productive enterprises. A properly organized effort, actively supported by bankers, business men and workers, could make this a continuing reality.

It is doubtful if the capacity of the American people to save and invest has ever been carefully appraised. A few figures in this connection are significant. Of the $65,000,000,000 estimated annual aggregate income of our people, probably $55,000,000,000 is paid over by employers each year direct to their employees. The Comptroller of the Currency recently declared that "the income of the people of the United States in *excess of ordinary living expenses* probably amounts to $10,000,000,000 per annum." In this connection it is worth noting that for the year 1919 the American people paid taxes on $22,000,000,000 worth of articles classed by the revenue act as luxuries. Our national interests would have been better served had a portion of this outlay been reserved as productive capital.

At a time like this, when the supply of loanable funds is highly inadequate to meet the increasing demand, it is extremely important that bankers exert themselves to the utmost toward the stimulation of saving. A shortage of capital is manifest on every hand. As one evidence it may be noted that money rates are the highest in forty-eight years. Business men will appreciate their responsibility in this matter when they realize the direct relationship between the accumulation of savings and the limits of credit expansion. Just as credit is based upon available funds, capital in turn can come only from savings. There can be no mistake therefore about the urgency of drawing every idle and hoarded dollar, and all potential savings, as rapidly as possible into financial channels. Gathered into the banks and the National Treasury this money forms the basis of credit. It has been estimated that the idle and hoarded money alone in America may run into ten figures.

Bankers and business men can render the country as well as themselves invaluable assistance by co-operating in an effort to draw these funds into circulation.

Many people do not know that their savings can exert an important influence upon the economic life of the nation. They are scarcely aware that their savings furnish part of the capital and credit to carry on the enterprises which give them their living. Little do they understand that the savings banks are one of the channels through which they indirectly provide capital to develop our great railroad systems, to finance building operations and municipal undertakings; that the commercial banks are a medium through which the funds deposited by the many are made available for productive purposes; that investment bankers are a channel through which capital goes to finance huge corporate enterprise.

There is nothing more inspiring than the optimism of a man awakening for the first time to the illimitable economic possibilities of an America turned a nation of savers. A vision of boundless growth and prosperity unfolds before him. He sees a nation of thrifty and industrious workers speedily recovering the bless-

ings of prosperity. Fortunately for America, and for the world such a dream is not impossible of realization. While thrift alone is not sufficient to lead America into the sunlight of prosperity, it is the one great constructive force now required throughout the world. True, thrifty living by itself cannot guarantee the speedy return of better conditions, though naturally enough bankers were the first to recognize after the storm of war had subsided that without real economy in every household the future was none too promising.

The time has come when the people of America know the need for economy. In a great many cases they have learned this from recent personal experiences.

Viewing the situation from the standpoint of developing new sources of capital it seems therefore that this is an opportune moment to drive the "savings idea" home to the individual. The man out of work now realizes the value of a fund saved for emergencies and when he again returns to work he will be grateful for an opportunity of safely investing some of his earnings. Even the worker who is not out of employment takes a lesson in thrift from the regrettable condition of many of those who were until lately his co-workers in industry.

Open Price Associations

[FROM OUR REGULAR CORRESPONDENT.]

WASHINGTON, D. C., June 8, 1921.—There has been considerable talk recently about the "Open Price" Association. Last week the President made mention of these associations and on the same day the Attorney General made a statement to the newspaper men that the whole open price association question is being taken up by the Department of Justice.

Investigations of many of these associations have been conducted, and, while the Attorney General said that it was not the policy to institute a general dragnet, those which are thought to be violating the law will have proceedings brought against them in the courts.

The Hardwood Lumber case is pending in the Supreme Court and the Yellow Pine case in St. Louis as a result of the proceeding begun under the Wilson administration, the Attorney General said, adding that decisions would be reached soon as to whether action would be begun against another organization for violation of the anti-trust laws.

The policy of the department, he asserted, was to call in the officers of an association which investigation disclosed to have violated the anti-trust laws and make an effort to persuade them to discontinue their practices. There was no intention on the part of the government to attack business associations, he declared, but there was considerable doubt, due to conflicting court decisions, as to how far business men could go in their organizations without violating the laws.

The object of the movement on the part of the Department of Justice, Mr. Daugherty stated, was to have the law definitely determined so that both the government and the business men would know where they stood.

Associations collecting and disseminating trade information cooperated with the government during the war as a necessity, the Attorney General said, but now the data was distributed among the members, but not given the government, and it was to be determined whether the acquiring and use of this information might be turned to price fixing and providing territories to concerns in violation of the law.

Mr. Daugherty said he had discussed the matter with Secretary Hoover, who is holding a series of conferences with representatives of leading industries in an effort to obtain their co-operation in the publication of comprehensive trade statistics by the government, and that information and advice on the subject had been exchanged.

In connection with Mr. Hoover's proposal for the formation of combinations of exporters to compete in foreign trade with their rivals abroad, Mr. Daugherty said he thought such organizations could be reconciled with the anti-trust laws as long as there was nothing effected which would cause the fixing of prices in this country.

Manufacture of Paper and Wood Pulp

[FROM OUR REGULAR CORRESPONDENT.]

WASHINGTON, D. C., June 6, 1921.—A preliminary statement of the 1920 census of manufactures with reference to the manufacture of paper and wood pulp has been prepared by the Bureau of the Census, Department of Commerce. It consists of a detailed statement of the quantities and values of the various kinds of paper manufactured during 1919, and of the quantity of wood pulp made, whether produced for sale, or for further manufacture into paper by the mill reporting.

Returns were received from 713 establishments engaged in the industry in 1919, with products to the value of $789,548,000. Of the total number, 481 establishments manufactured paper only, 61 wood pulp only, and 171 both paper and pulp. At the census of 1914 there were 718 establishments with products valued at $332,147,000. At the census of 1919 the production of paper amounted to 6,124,000 tons, valued at $682,043,000, as compared with 5,269,000 tons valued at $291,588,000 in 1914, an increase of 16.2 per cent in tonnage and 133.9 per cent in value.

The statistics for 1919 and 1914 are summarized in the following statement. The figures for 1919 are preliminary and subject to such change and correction as may be necessary from a further examination of the original reports.

PAPER AND WOOD PULP—CENSUS BUREAU'S SUMMARY FOR THE INDUSTRY: 1919 AND 1914

Products	Quantity (tons of 2,000 pounds) 1919	Quantity (tons of 2,000 pounds) 1914	Value 1919	Value 1914
Wood pulp produced (including that used in mills where manufactured), total	3,519,000	2,893,000	.....	.....
Ground, tons	1,519,000	1,294,000	.....	.....
Soda fibre, tons	412,000	348,000	.....	.....
Sulphite fibre, tons	1,420,000	1,151,000	.....	.....
Sulphate fibre, tons	120,000	52,000	.....	.....
Screenings, mechanical tons	12,000	12,000	.....	.....
Screenings, chemical, tons	36,000	36,000	.....	.....
Total value of products (1)	.....	.....	$789,548,000	$332,147,000
Newspaper, in rolls and sheets	1,324,000	1,313,000	98,560,000	52,943,000
Hanging papers	69,000	97,000	6,043,000	4,489,000
Poster, novel, tablet, lining, etc.	80,000	(2) 8,000	7,273,000	(2) 491,000
Book paper:				
Plain	819,000	787,000	118,271,000	58,496,000
Coated paper	132,000	117,000	24,010,000	11,606,000
Plate, lithograph, map, etc.	10,000	9,000	1,556,000	588,000
Cover paper	40,000	22,000	9,531,000	2,809,000
Fine paper	325,000	248,000	87,741,000	34,055,000
Wrapping paper, including bag paper	932,000	882,000	114,936,000	49,373,000
Tag stock (rope, jute, etc.)	27,000	29,000	5,460,000	1,936,000
Boards:				
Wood pulpboard	180,000	116,000	14,888,000	4,227,000
Strawboard	228,000	175,000	12,230,000	4,270,300
Newsboard	89,000	128,000	4,604,000	3,502,000
Binders' trunk and press boards	43,000	61,000	3,788,000	2,664,000
Cardboard, bristol board, card middles, etc.	85,000	83,000	11,104,000	5,376,000
Leather board	28,000	27,000	2,263,000	1,177,000
Chip board	714,000	(3)	37,749,000	(3)
All other	518,000	701,000	37,464,000	23,652,000
Tissue paper	191,000	115,000	40,696,000	11,536,000
Blotting paper	13,000	14,000	3,209,000	1,458,000
Building paper	195,000	244,000	17,737,000	9,476,000
All other paper	82,000	93,000	16,461,000	7,464,000
All other products including wood pulp manufactured for sale	.....	.....	113,974,000	40,559,000

(1) In addition, in 1919, five establishments engaged primarily in the manufacture of other products, produced paper and pulp to the value of $1,064,772, and in 1914, nine such establishments manufactured $2,767,407 worth of paper and pulp.

(2) Reported as poster paper in 1914.

(3) Included in all other boards in 1914.

F. PAGENSTECHER ELECTED TO HEAD BRYANT PAPER CO.

Succeeds Frank H. Milham, Who Died Suddenly on the Night of May 23 in Pasadena, Cal.—Mr. Pagenstecher Was General Manager of the Company and Was the Logical Successor to the Late Mr. Milham—Funeral Services of Mr. Milham Largely Attended by Prominent Paper Men From Various Sections of the Country—General News of the Trade in the Kalamazoo Valley.

[FROM OUR REGULAR CORRESPONDENT.]

KALAMAZOO, Mich., June 2, 1921.—Felix Pagenstecher, general manager of the Bryant Paper Company, has been elected president of that concern to succeed the late Frank H. Milham, who died the night of May 23, in Pasadena, Calif.

The selection of Mr. Pagenstecher for this important position was made at a special meeting of the company's directors held Wednesday evening. The choice meets with universal favor among

FELIX PAGENSTECHER

all classes, for Mr. Pagenstecher is one of Kalamazoo's most liked and most respected young business men. It means for the Bryant Paper Company a continuance of the well grounded policies established by the late Mr. Milham during his long period as head of the company. It is generally well known that Mr. Milham engaged Mr. Pagenstecher as his assistant on account of the latter's superior business qualifications and wide knowledge of the paper industry, and at such time as Mr. Milham saw fit to relinquish the responsibilities of the office of president, he would have been an able successor to take up the work at hand.

Mr. Pagenstecher came to Kalamazoo in 1902 and was elected secretary of the newly organized Riverview Coated Paper Company. Under his personal guidance this concern became one of the most prosperous in the Kalamazoo valley district. It grew from a small six coater plant to one boasting of 18 coaters and in addition operated its own paper mill.

Then came the consolidation of the Kalamazoo Paper Company and the Riverview Coated Paper Company under the former name and with a capital of $1,605,000. Mr. Pagenstecher was made secretary of the consolidated companies, remaining with that concern until 1919, when he resigned to accept a position with the Bryant Paper Company, as assistant to President Milham. In a brief period he was advanced to the position of general manager, a post he occupied when death so suddenly removed Mr. Milham from his activities.

Congratulations are now pouring in on the newly chosen executive, but they are accepted with a modesty characteristic of the recipient. His only comment was "I certainly appreciate the confidence shown in me by the directors of the Bryant Paper Company and fully realize the responsibilities of the position I am to fill. My one regret is that my advancement is the result of such an unfortunate incident as the death of Mr. Milham."

Funeral Services of the Late Mr. Milham

The impressive funeral service of the Episcopal Church was conducted Memorial Day afternoon at the burial of the late Frank H. Milham, president of the Bryant Paper Company and former mayor of this city. The remains arrived on Saturday evening, being brought here from Los Angeles, Calif. They were accompanied by Mrs. Milham, Miss Cora Welsh and Felix Pagenstecher, who journeyed as far west as Albuquerque, N. M., to join the party.

The last sad rites were held in the family residence, Rev. B. F. P. Ivins, rector of St. Luke's Church, officiating. Floral offerings of great beauty and number were banked everywhere and showed the great esteem in which this financial and industrial leader was held. The crowd of friends and former associates filled the home and overflowed the wide spacious lawns surrounding. Employees of the Bryant Paper Company were given preference in seating, for to them Mr. Milham was a true friend. The interment took place in the family lot, Mountain Home Cemetery. The bearers were Fred C. Duncan, Joseph E. Brown, C. Allen Fox, George M. Freeman, James B. Freeman, Charles Oberly and E. M. Gilman.

The funeral brought to this city an unusual number of men prominent in the paper industry. Among those present were Fred Duncan, Toronto; J. B. Seaman, W. P. Leech, Frank Tufts, M. J. Chisholm, Charles Gordon, Robert John, William Gallear and W. M. Galland, New York city; George M. Seaman, D. R. Seaman, Clayton Seaman, Henry Schott, L. J. Bigelow, F. A. Borchers, F. M. Stephens, George W. Gould, L. T. Dwyer, William Plant, G. Wuerst, J. E. Cavanaugh and J. E. Ferguson, Chicago; Frank J. French and J. E. French, Niles; B. F. Newhouse, Minneapolis; P. E. Baker, W. A. Norman and W. A. Garner, St. Louis; Julius Ragenstein, Robert Eastman, E. E. Calvin, Cromwell Jones, Justin Rothschild, James Fleet, V. D. Simmons and F. Hughes, Chicago; A. J. McKay, Appleton; Clark Everett, Marathon, Wis.; Charles Oberly, Munising, Mich.; William Stewart, Cincinnati, while in addition every mill in the Kalamazoo Valey was officially represented.

General News of the Trade

The Michigan Paper company, Plainwell, has started its plant again and is now running full five days each week. There are orders enough on hand to operate for a considerable period.

It is reported that the Michigan Carton company, Battle Creek, is taking on men daily and that the number now employed is considerably in excess of thirty days ago.

The River Raisin Paper company, Monroe, has sued the Escanaba Manufacturing company, Escanaba, Mich., for $50,000. The claim is made it is for goods delivered but never paid for.

Winship Hodge, general manager of the Western Board and Paper company, has returned from a quest for brook trout at points in the northern part of the state. He was accompanied by Mrs. Hodge and they were absent two weeks.

The Rex Paper company, Kalamazoo, and the Watervleit Paper company, Watervleit, both operating one machine mills, have been able to run steadily during the present depression, losing practically no time at all outside the annual Holiday vacation.

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LABOR TROUBLE IN CANADA IS STRAIGHTENING OUT

Paper Mill Workers, Although Loath to Accept a Reduction From the High Wages Paid During the Boom Period, Are Coming, It Is Reported, to Recognize That a Lower Wage Level Is Inevitable—Canadian Export Paper Co., in Line with the General Reduction in Pulp and Paper Mill Wages, Announces That the Price of News Print on Contract for July, August and September Will Be 4¾ Cts.

[FROM OUR REGULAR CORRESPONDENT.]

MONTREAL, Que., June 6, 1921.—Labor troubles in the pulp and paper mills in Canada seem to be straightening themselves out along the lines which might naturally be expected. As in the case of every other industry, the workers were loath to accept a reduction from the high wages paid during the boom period, but are coming to recognize that a reduction is inevitable. From Quebec it is announced that the big pulp and paper mills of Price Brothers & Co., of Jonquieres and Kenogami have been re-opened and are now in full operation again. This followed upon a meeting at which a deputation from the men expressed willingness to accept the conditions offered by Sir William Price. A despatch from Quebec says that Sir William Price's terms are very pronounced. They include a 20 per cent reduction in wages to bring these into line with present prices; but the most important point is that in the agreement he insists on the men in the mills having no part with international Unions. Sir William is stated to show fairness and justice in all dealings with the men, but is determined that foreign agitators shall not dictate conditions to him or to his men.

At the time of writing, it is reported that negotiations are proceeding with the Spanish River and Abitibi workers and it is likely these will go back to work at an early date on the same basis as that arrived at by Price Brothers & Co., as regards wages.

All the lumber and pulp plants of the Fraser Company, Limited, consisting of twelve lumber mills and two pulp mills in New Brunswick and Quebec, resumed operation at full capacity this week, according to a statement by Donald Fraser. Mr. Fraser said that orders of sufficient size, although at greatly reduced prices, had been secured to warrant commencing operations of all the plants.

The Fraser Companies, he said, were taking action to bring the costs of necessities lower for their employees by opening their own retail stores which would be conducted without profit. One of these stores, he said, was now already fitted up at Chatham and would be opened if necessary and, he added, similar action was under consideration for Fredericton. Upwards of 3,000 men are directly affected by the re-opening of Fraser Companies industries, the largest number of employees being at Edmundston where approximately 500 are engaged. The daily output of the companies' plants is approximately 230 tons of pulp wood and 1,200,000 feet of long lumber as well as shingles, lath, boxwood, etc. All the lumber mills are being operated on 10-hour day, the wood rooms of the pulp mills are working 9 hours and the pulpmakers 8 hours. Wage reductions ranging from ten to thirty per cent have been made effective. The Fraser Companies' lumber mills on the Miramichi, where there has been a strike against the 10 hour day, have resumed operation, as well as other Miramichi lumber mills, on the 10-hour day basis.

The Price of News Print

In line with the general reduction of 20 per cent in wages in the pulp and paper mills, the Canadian Export Paper Company of Montreal has announced that the price of news print on contract for the months of July, August and September will be 4¾ cents per pound, or $95 per ton. This compares with $130 per ton for the first quarter of 1921, and $110 for the second quarter. The Canadian Paper Company markets the news print for the following companies: Laurentide, Price Brothers, Belgo-Canadian, Brompton, and St. Maurice. It is expected that other companies in Canada will adopt a similar price.

It is stated that one of the mills concerned has a yearly wage bill of $4,000,000, and the 20 per cent in wages would mean a saving of $800,000 annually. It is proposed to pass this saving on to the consumers, it being figured that the same company on the basis of the lowering of the rate by three-quarters of a cent per pound would mean a reduction in revenue of approximately $750,000. This means that the companies will be able to operate at the lower rates on the basis of existing profits which have been known to be excellent. It was stated in the same connection that the lowering of the price will enable the Canadian companies to meet the competition of foreign imports into the United States which are being offered around 4½ to 4¾ cents per pound. The American consumers accustomed to the Canadian product will, it is further claimed, much prefer the goods turned out here in preference to the European article, and will even be prepared to pay a slightly higher price owing to the quality of the news print, the dependability of deliveries and the closer and more satisfactory financing arrangements.

It is interesting to note in the same connection that it has been long contended by the manufacturers that if a wage readjustment could be secured, the trade would at once benefit. It has also been contended that to give consumers cheaper raw materials would be a constructive step of the first importance, provided it could be done without weakening the financial position of the producers. The Canadian or American mills, it is claimed, have not as yet received as much as a $95 per ton rate for a full year. Assuming that the rate might continue on to the end of the year on that basis, it would strike an average of $120 for the first six months and $95 for the second, thus giving an average rate for the full year of $104.50, which will be a record for any year since the inception of the industry and make the publication cost of newspapers still at the peak for the full year.

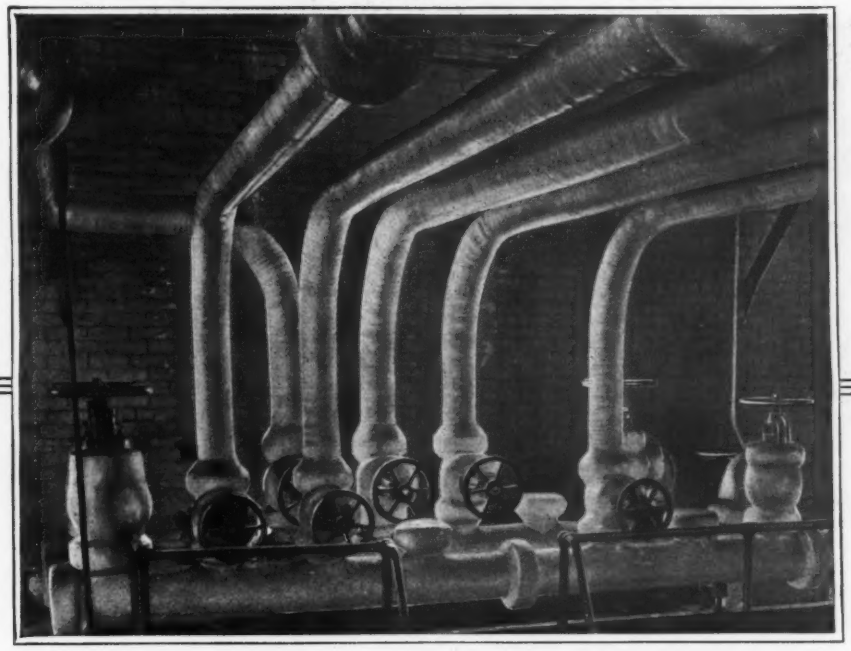
New Paper Mill

Establishment of a pulp and paper mill adjacent to Winnipeg, which when completed will employ on an average of about 700 men the year round and at an approximate cost of $5,000,000, is forecast with the acceptance by the Dominion Government of the tender of J. D. McArthur, for an extensive pulpwood concession to the east of Lake Winnipeg. This mill is expected to obviate a recurrence of the dearth of news print supply in the prairie provinces. The concession consists of 718 square miles of pulp and timber land east of and adjacent to Lake Winnipeg. Mr. McArthur is to construct a pulp and paper mill costing at least one million dollars, to be completed within three years. It is to have a capacity of one hundred tons a day. Not less than fifty per cent of the pulp is to be manufactured into paper at the mill. The balance may be disposed of otherwise, except that if, in the opinion of the Minister of the Interior, it is required for the domestic market in Manitoba, Saskatchewan and Alberta, export will be banned. The grant also involves timber apart from pulp wood. The concessionaire intends to start work as soon as possible and give employment to several hundred.

Affairs of the Riordon Co.

A further step in the adjustment of the Riordon situation is indicated in a circular issued by a Committee of the larger creditors of the Riordon Company, Limited, representing claims aggregating $3,383,000.

(*Continued on page* 84)



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LABOR TROUBLE IN CANADA IS STRAIGHTENING OUT

(*Continued from page* 82)

The contents of this circular are reassuring in their influence and request the unsecured creditors to grant a stay of all legal proceedings until July 25, and for the privileged creditors within the same period to proceed no further than the registration of their liens.

The reasons given for this delay are as follows:

1.—The financial position of the company is such that it is unable to meet its obligations as they fall due and the Committee at present in charge of the company's affairs under the Chairmanship of F. P. Jones, is determined that no one creditor shall be paid anything in advance of or to the detriment of other creditors.

2.—If legal proceedings are instituted the company would be forced into liquidation and it is doubtful if, after satisfying the claims of the bondholders, the banks and the secured creditors, there would be any moneys left over for the benefit of the unsecured creditors.

3.—To tide over the present difficulties and to place in the Treasury sufficient funds for working capital a sum of $5,500,000 of new money is necessary, and it is not possible to obtain this money and conclude the arrangement in connection therewith in a shorter period.

4.—If the $5,500,000 referred to above is forthcoming, it is probable that all the creditors will obtain 50 per cent of their claims in cash, and the balance in three-year notes containing provision for earlier payment, in whole or in part, if moneys should be available from earnings of the company.

5.—No creditor's standing will be injured by the delay, but all will be on an equally strong footing as at present, and if the money is raised will be in a decidedly better position.

At the present time, the bankers interested in the securities of the company are able to report that about $3,000,000 out of the $5,500,000 desired are in sight provided the creditors will consent to the suggested delay and provided also that the bond interest due on June 1 and amounting to $240,000 will be paid on the due date. Should the latter not be paid, however, it is obvious that these arrangements for the sale of new securities would be jeopardized.

During the 60 days' delay asked for from the creditors, opportunity will be taken to convince the preferred shareholders of the wisdom of protecting their present investment by subscribing to the bonds now offered, and it is hoped and believed by the financial houses interested that the effort will meet with success.

Crown Timber in Quebec Province

In the Province of Quebec, nearly 90 per cent of the licensed Crown timber area is comprised within the boundaries of the four co-operative Forest Protective Associations, the St. Maurice, the Ottawa River, the Laurentians and the Southern St. Lawrence. These associations are maintained primarily by the limit-holders and timber owners, but the Provincial Government co-operates financially and otherwise, and the officers of the associations hold appointments as officers of the Crown. The Provincial Forest Service administers fire protection direct on areas outside association boundaries, including a large territory north of the Transcontinental Railway.

The total area in the four associations is 40,123,083 acres. During 1920 fires reported totaled 947, of which 634 were extinguished by the rangers without extra labor, 313 requiring the employment of extra men for this purpose. The total cost of extinguishing fires amounted to $56,714 aside from the regular staff. Total assessed income for the four associations was $290,055. The total area burned over within association territory was 252,795 acres, of which 67,886 acres, or 27 per cent, was merchantable timber. Young growth comprises 12 per cent, cut-over land 24 per cent, and old burns 37 per cent. The total number of men on regular patrol was 450 and these men issued 7,652 permits for the regulated burning of settlers' clearing operations.

Technical Section's Summer Meeting

The annual Summer meeting of the Technical Section of the Canadian Pulp and Paper Association will be held at Three Rivers on June 14, 15 and 16. It is expected that a party of between 50 and 60, under the chairmanship of George Carruthers, of the Interlake Tissue Mills, will attend the meeting. They will leave Montreal at 10.15 A. M. on June 14, and will pay visits to the mills of the St. Maurice Pulp and Paper Company and the International Paper Company at Three Rivers and will visit the Laurentide Company's plant at Grand 'Mere, after which they will go to Shawinigan Falls for visits to the Belgo-Canadian Pulp and Paper Company's mill and the Shawinigan Water and Power Company's plant.

Mr. Beck Arrives in Stockholm

Edward Beck, who is in charge of publicity for the Canadian Pulp and Paper Association, has just sent word to headquarters that he has arrived in Stockholm. He has been commissioned by the Association to visit the Scandinavian countries to make a thorough investigation into their system of forest conservation and other matters of interest to pulp and paper manufacturers. In addition to preparing a report for the use of the members of the Association, he has arranged to write a series of articles which will be syndicated in the papers throughout Canada, and which it is expected will be of considerable educational value, in view of the great importance which forest products industries are attaining in Canada.

Paper Company Appeals Judgment

The case in which A. J. Brown, K. C., has obtained an injunction enjoining the Canada Paper Company to refrain from using at its paper manufacturing plant at Windsor Mills, Que., sulphate of soda or other compounds calculated to give off obnoxious smells, was brought before Chief Justice Lamothe and Justice Tellier, sitting in Chambers in the Court of Appeal in Montreal this week, on a motion asking that the injunction be suspended pending judgment on the issue which has been carried in appeal to the Supreme Court. The motion pointed out that if the judgments appealed from were to be put into effect, the company appellant would suffer irreparable injury and be obliged to discharge a number of its employees. In the circumstances it was asked that the judgments be suspended until the appeal pending before the Supreme Court is decided. Their Lordships were of the opinion to reject the appeal, holding that the motion could be granted only by the Supreme Court.

Prairie Mills to Be Enlarged

A despatch from Winnipeg says that the capacity of the Red River Paper Mills will be doubled, with the possibility of redoubling, according to plans now under consideration by the Company.

Coast Lumber Business Active

Lumber business on the Pacific Coast during the past couple of months has been very active, shipments being made to Egypt, South America, India, United Kingdom and other distant countries. Recently the H. R. McMillan Export Company secured an order for 3,500,000 feet of ties for delivery at Buchang, China, in June. They have also an additional order from the same buyers for 1,500,000 feet of lumber, which is to be shipped at the same time as the other order goes forward.

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THERE is no need to go abroad for CLAY. Our enormous capacity can safely take care of your requirements. All through the war, paper mills were served to their entire satisfaction by our five plants, both as regards deliveries and QUALITY.

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Our experience in clay washing is longer by many years than that of our nearest competitor.

Our clay is positively the lowest in percentage of grit and moisture of ANY clay, domestic or foreign. When you contract with us for shipments you can depend upon prompt deliveries whether the season is rainy or dry.

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FROM MINE TO MILL

American MADE *For* American Trade

IMPROVEMENT CONTINUES IN PHILADELPHIA MARKET

Betterment Has Been General in Practically All Lines of Fine Papers and Coarse Papers Also Have Continued Steadily to Improve—Reduction, However, of One-Half to One Cent Per Pound on Kraft Is Reported—Distributors of the Strathmore Papers in Philadelphia Tender Banquet to Printers and Other Consumers of Paper—Flat-Rock Mill Reopens After Several Weeks' Shut-Down.

[FROM OUR REGULAR CORRESPONDENT.]

PHILADELPHIA, June 6, 1921.—The improvement has been general for all grades of fine papers with machine finished book perhaps leading. Flats and writings are selling rather quietly, however.

The coarse paper market continues steadily to improve. The only noteworthy development of the week so far as Kraft is concerned, was a reduction of from 1½ to 1 cent by a number of leading manufacturers. Corrugated papers declined in mill quotation from 10 to 15 per cent. A special lot of 250 tons of rag wrap was offered during the week by one of the jobbers at less than 1¾ cents but was hard to move. Glassines are reported as being very plentiful and weak in price as also are tissues. Screenings, too, are plentiful. In a general way it may be said that the cheapest grades of coarse papers are in larger supply than demand, and with prices rather soft. On the whole, however, the coarse paper market is in an improving condition and prices tending toward steadiness.

Despite the fact that only very small quantities of paper stock are coming into the warehouses of the jobbers, prices are very unsteady. Many of the larger jobbers are refusing to take in mixed and commons even when these are offered for nothing. A case was reported during the week in which a stock dealer actually was paid for hauling away mixed papers from a large manufacturing establishment. Because of the disturbed labor conditions, book binders are producing very small quantities of waste and there is not much of this on the market. Quotations, however, are still virtually nominal for there is not sufficient mill demand to really make a market.

Strathmore Distributors Dine

Surpassing any occasion of the kind in Philadelphia paper trade annals was the banquet tendered on Friday night last by the five recently designated distributors of the Strathmore papers, the Charles Beck Company, the Paper House of Pennsylvania, The Thomas W. Price Company, A. Hartung and the Raymond-McNutt Company, to more than 400 paper consumers—printers, lithographers and engravers, advertising agencies, illustrators—from all Philadelphia, Pennsylvania east of Harrisburg and York and New Jersey south of Trenton. After an elaborate banquet the guests were entertained and instructed by addresses dealing with color harmony and color balance generally and with the Munsell theory and its application, by the Strathmore Company, to paper making, specifically. The evening concluded with a "colorful drama" in one act written by Edward Goodman of the Federal Advertising Company and called "You Got a Good Eye." The guests were seated in congenial groups about sixty tables in the Rose Garden of the Bellevue-Stratford. Music by an orchestra and choral singing by all was interspersed between courses. At their conclusion Leon Beck, of the Charles Beck Company, said that the purpose of the gathering was to increase sociability between the Strathmore distributors and their customers, and to give them an opportunity of hearing experts on colors, tell the story of their standardization by the Munsell system and of the practical application of the resulting benefits. Arthur S. Allen of Philip Ruxton, Inc., ink manufacturers, who have applied the Munsell classification to their products, discussed "Color Standardization." He said that the range from white to black had been divided into nine parts with the fifth, a medium gray as the mean. This fifth gradation was where color balanced. By means of a color wheel, he showed that certain proportions of complementary colors produced this balance of grey and that in good color printing these proportions were observed. He then described the Munsell system which designates color according to the measurements of three standards, the hue, the value and the chroma so that by the use of a formula as R 4/5 there can be designated a red of 4 color value and 5 chroma and that this shade will be identical in San Francisco or Kalamazoo, permitting absolutely matching of color merely by the formula. T. M. Cleland, designer, amplified the description of the Munsell system in discussing "The Relation of Color to the Graphic Arts." In speaking of the theme, "Color From the Viewpoint of the Paper Maker," M. H. Grassly, of the Strathmore Paper Company, pointed out that the whole effort of the first paper makers was directed toward the production of a pure white paper but that in the development of the industry and through the use of various raw materials, papers other than white gradually was produced. The latest development he said was the production of colored papers adapted to a wide variety of uses and making for better color printing than where a pure white paper is used. He said that the Strathmore Company had adopted the Munsell standard in the production of its colored papers because that means an exact, definite and unvarying color and made easily possible for the color printer to produce harmonious and balanced effects. Finally C. W. Dearden, of the Strathmore Paper Company, described its publication, "A Grammar of Color," which tells of the Munsell system and of its application to paper making and color printing and through which the production of artistic effects is possible to all. Applications for the book, accompanied by a check for $10, are to be made direct to the Strathmore Company. Salesmen of the paper houses distributing the paper, will show the work, which has cost the Strathmore Company over $100,000 to produce, to consumers and will take their orders for it.

Alfred M. Watts in New Location

Alfred M. Watts, formerly located at 328 Chestnut street, has taken larger quarters at 218 Chancellor street where, in addition to the general coarse paper line in which he has been engaged for several years, he also will carry a line of fibre containers, among them the Weis Fibre Container Corporation products. A wholesale business only is being done. Mr. Watts will organize a sales force to cover the territory adjacent to the city.

Flat Rock Mill Reopens

The Flat Rock Mill of the Dill & Collins Company reopened at the close of last week after a shutdown of several weeks. During the week the company was host to 80 purchasing agents representing as many Philadelphia industrial organizations, at its Delaware Mill, Port Richmond. The buyers were shown every stage of paper manufacture and then were tendered a dinner at the mill. As souvenirs of the visit, each received an envelope with samples of sulphite and soda pulp, finished paper and printed signatures. The company is sending to consumers what is regarded as the most compact yet comprehensive handbook ever issued by a paper maker and distributor. All the pages are side indexed. They contain double page classifications of all the Dill & Collins brands, showing grades, sizes, weights, substances, bulks and codewords. A pouch on the last inside page contains the current price list. By the use of the books, valuable not only to users of Dill & Collins paper, printers and others have at hand, in most accessible

(*Continued on page* 88)

Howard Bond

Howard Ledger

"The Paper of Many Uses"

Manufactured by

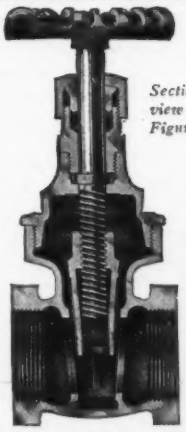
THE HOWARD PAPER COMPANY, Urbana, Ohio

REG. U.S. PAT. OFF.
TRADE JENKINS MARK

Jenkins Bros

Jenkins Brass Gate Valves
(Standard Pattern)

Fig. 370 is designed for 125 pounds working steam pressure or 175 pounds working water pressure, and can be repacked when wide open under pressure. Equipped with non-heat hand wheels; or can be furnished with brass wheels, finished or plated, or special finish according to requirements.



Sectional view of Figure 370.

Figure 370.

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New York Chicago Montreal Philadelphia Pittsburgh London St. Louis Boston San Francisco Washington Havana

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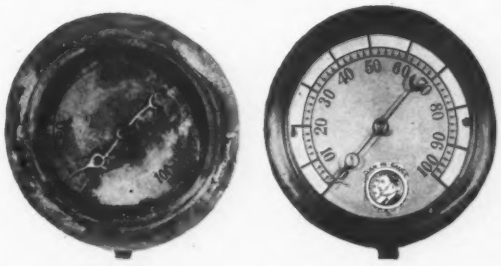

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We guarantee our work and all gauges leaving our plant look and operate like new.

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PAPER DEMAND IN CHICAGO CONTINUES RATHER QUIET

Larger Number of Inquiries, However, Have Been Received Recently and This Leads to the Conclusion That Business Will Show an Improvement Before Long—Western Division of the National Paper Box Manufacturers' Association Meets at the Old Colony Club to Consider Plans for the Next Meeting of the Western Division of the Association in January—Other Trade News.

[FROM OUR REGULAR CORRESPONDENT.]

CHICAGO, June 6, 1921.—Business among the paper jobbers of Chicago has been going along with very little change noted by any of the members of the trade. The tendency has been slightly for the better, but no great progress has been made in that direction.

Members of the trade here say that while they expect that the situation will change and that orders will materialize from the many inquiries they have been receiving, business up to the present time has not been what they hoped for.

Buying of paper continues slow.

While the paper buyers are reluctant to place orders for more paper than to cover their immediate requirements, jobbers here feel that just as soon as various contingencies which are now pending, and which tend to hold back the buyers from going into the market and placing larger orders, business will pick up materially. To a great extent, the feeling that business will soon show signs of a better trend and continue to work toward a better condition is due to the great number of inquiries which have lately been received.

New Field for Paper Product

A new field for the product of paper manufacturers has just been uncovered. Last week, a test shipment of chairs in a fiber board carton arrived in Chicago for Indianapolis. This test was made after many attempts to reduce the weight of such shipments and thereby reduce freight rates. It is said that upon the arrival of the fiber container in good condition, it received the "O. K." of the carrier's representatives. It is expected that the chair manufacturing industry will start to use this container for shipping purposes rather than the wood crate. Specifications were not made known, but it is expected that the use of this container will be incorporated into shipping rules.

Paper Box Manufacturers Meet

A meeting of regular and associate members of the Western Division of the National Paper Box Manufacturers' Association was held here Friday noon, June 3, at the Old Colony Club, in the Hotel La Salle. The meeting was held to consider plans for the next meeting of the Western Division of the Association and to select a hotel at which this meeting will be held. The next meeting will be held in January, 1922, in Chicago.

Robert H. Ritchie, of the W. C. Ritchie & Co., chairman of the Western Division, presided.

The meeting was very well attended, twenty-five paper box, board and machinery men being in attendance.

Though no definite arrangements were made at this meeting for the next meeting of the Western Division, favor was shown toward the Drake Hotel as the logical place to hold the January meeting. Mr. Ritchie will appoint a committee of three to handle the decision on a hotel.

As Chicago has been suggested as the next meeting place for the annual convention of the National Paper Box Manufacturers' Association, which is held in May every year, and which was held last month in New York, there was some discussion as to whether it should be suggested that the national meeting be held jointly with the Western Division in January or not. Some of the Western members favored French Lick, but the vote went for Niagara Falls as the next meeting place for the 1922 convention. These suggestions will be made to the executive committee, who will decide upon a meeting place.

General News of the Trade

A meeting of vegetable parchment manufacturers will be held at the Congress Hotel, Thursday, June 9.

Glassine and grease-proof manufacturers will also hold a meeting on the afternoon of June 9 at the same hotel.

The association of waxed paper manufacturers will hold a meeting on Friday, June 10, at the same hotel. The latter meeting will be held at noon.

All three will be purely business meetings, touching the present financial conditions and the various phases of the industries represented.

The Economy Metal Edge Box Company has just recently rented the first floor and basement of 358-366 West Huron street for a reported term rental of $27,000.

Members of the Carton Club of Chicago will enjoy their first picnic of the year at the Pink Poodle Farm on June 17. Last year one of these picnics was held every month through the summer. The paper box manufacturers, members of the club, are glad to see the right kind of weather return so that the monthly outings can be resumed.

IMPROVEMENT IN PHILADELPHIA

(*Continued from page* 86)

form a mass of highly valuable information. Howard Taylor, vice-president of the company and manager of production, is recuperating at Atlantic City from a severe attack of illness but it is expected that shortly he will return to his duties.

General News of the Trade

The Property Committee of the Board of Education will open bids this week for supplying the schools with approximately 250 tons of paper. All is to be water marked "B. of P. E., Phila." Requests for specifications have been received from New York, Boston, Baltimore and Chicago.

The largest of the three mills of the Reading Paper Mills Company, at Reading, Pa., was opened during the week. Employment is given to eighty hands. Another of the mills is to be started this week.

P. H. Diffenbaugh, formerly of the Whiting-Patterson Company, and latterly of the Paper House of Pennsylvania, has resigned to become a solicitor for printing.

W. Allan Lindsay, of Lindsay Brothers, during the week registered a double win over more than sixty contestants at the registered tournament of the Quaker City Gun Club at Maple Grove. He won the special Maplewood Hundred Event. He also finished high over all with 146 dead.

The Garrett-Buchanan Company is making a display of the stages of production of bond and ledger papers. Hosiery and underwear clips, pulp chemicals, etc., are included.

Frank J. O'Neill, president of the Paper Manufacturers Company, 6th and Cherry streets, spent the week on a trip to the New England mills.

The Paper Products Company, formerly located at 223 North 23rd street, is removing to larger quarters at Hancock and Oxford streets, where the manufacturing end of the business will be developed.

The recently established Welsh Paper Company, northwest corner 7th and Chestnut streets, is featuring the Collins Manufacturing Company bond and ledger papers and the Whiting & Cook papeteries.

A. D. Lamson, representing the Ralston Company, Niagara Falls, formerly at 428 Sansom street, is now occupying offices in the Drexel Building, 5th and Chestnut streets.

PAPER and BOARDS

Carried in Stock in New York City

EDDY'S BOGUS BRISTOLS
White and Colors, 22½ x 28½—90

PURITAN MILL BLANKS
3-Ply to 10-Ply 22 x 28

VICTORY COATED BLANKS
22 x 28—3 to 10-Ply, C. 1 S. and C. 2 S.

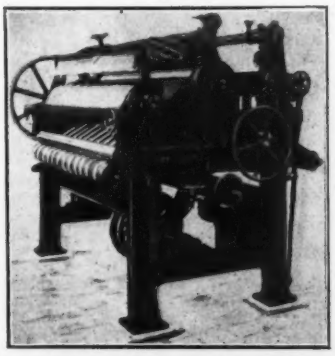
BEND-WELL COATED BOX BOARD
White and Colors, 28 x 44—.016

BERTCHILL BULKY WOVE BOOK
All Weights in 30½ x 41, 33 x 41, 41 x 61

Berton C. Hill Company
INCORPORATED
Exclusive Mill Sales Agents
501 Fifth Avenue at 42nd Street
NEW YORK CITY

THE CLARK-AIKEN CO.

Successors to
H. C. Clark & Son Machine Co.
PAPER MILL MACHINERY
LEE, MASS.



Revolving Paper Cutters—Rag Cutters—Cylinder Paper Machines—Washing and Beating Engines—Chilled Iron and Paper Calendars—Fan and Stuff Pumps—Engine Roll Bars and Bed Plates—
Cylinder Molds—Marshall Drives—Slitters and Rewinders—Reels—Dryers with Improved Packing Boxes—
Wet Machines—Gun Metal and Rubber Rolls—Rolls Reground.

Install Your Own Bleach Plant

It Pays! It Pays!

No matter what the market price of bleach

It is poor economy to buy bleach at the present high prices, when you can write off the initial cost of a Bleach Plant before prices come down.

A Bleach Plant is a decided investment for any manufacturer using two tons or more of bleach a day.

We design, construct and put in operation complete Bleach Plants and electrolytic plants for chlorine and caustic soda, using the Nelson Cell, which produces more chlorine and caustic soda per Dollar than any other cell.

Plants are simple, and easily operated.

We also advise as to the proper method of using liquid chlorine for making bleach.

More Recent Contracts:
Riordan Company, Limited—Temiskaming, Canada.
Toronto Paper Mfg. Company, Limited—Cornwall, Ont.
Diesen Wood Company—Wiborg, Finland.
A. B. Iggesunds Bruk—Iggesund, Sweden.
The Kellner Partington Paper Pulp Co.—Sarpsborg, Norway.
Titaghur Paper Mills Co., Ltd.—Bengal, India.

Write us for data.

SAMUEL M. GREEN COMPANY

Incorporated
ENGINEERS
Architects—Appraisers—Constructors
SPRINGFIELD, MASS., U. S. A.

Obituary

Henry Goethe

APPLETON, Wis., June 7, 1921.—Henry Goethe, treasurer of the John Hoberg Company, Green Bay, for ten years, died last week after a few hours' illness, from heart disease. Although his health had not been good for months his condition was not regarded as critical.

Mr. Goethe entered the employ of the Hoberg company as secretary about seventeen years ago and seven years later was made treasurer. He resigned last January because of ill health. Mr. Goethe was about sixty-one years old. He is survived by his widow and four children.

George E. Bellott

[FROM OUR REGULAR CORRESPONDENT.]

HOLYOKE, Mass., June 6, 1921.—George E. Bellott, of Pittsburgh, a salesman for the White & Wyckoff Manufacturing Company of this city, died in Portland, Ore., on Sunday, May 29, while on a business trip for the local firm. Mr. Bellott has represented the White & Wyckoff Manufacturing Company for almost 25 years. Funeral and burial services were held on Saturday and representatives from the selling staff and the home offices of the company attended the services. Mr. Bellott was well known throughout the West and was looked upon as a reliable and intelligent counsellor in matters pertaining to the stationery trade.

Bids for Government Paper

WASHINGTON, D. C., June 8, 1921.—The purchasing officer of the Government Printing Office has received the following paper bids:

16,000 pounds 21x32—No. 9, White Glazed Bond Paper: Old Dominion Paper Company at $.21524 per lb.; Geo. W. Millar & Company, Inc., $.215; The Whitaker Paper Company, $.199; Southworth Company, $.33; R. P. Andrews Paper Company, $.205; Esleeck Manufacturing Company, $.295 and $.35; Dobler & Mudge, $.205; Mathers-Lamm Paper Company, $.205; Rainbow Paper Corporation, $2.2085; Graham Paper Corporation, $.2525; John B. Harris Company, Inc., $.21.

12,000 pounds 21x32—30, Wood Manila Paper: The Whitaker Paper Company, $.0585 per pound; Dobler & Mudge, $.0575; Meikle & Wood, $.0620; Wilkinson Bro. & Company., Inc., $.068; Old Dominion Paper Company, $.0849; R. P. Andrews Paper Company, $.0623; Mathers-Lamm Paper Company, $.0585; The Richardson Company, $.0695; Maurice D'Meara Company, $.0648, and Geo. W. Millar & Company, Inc., $.0860.

58,000 pounds 38x48—No. 1, 58 lbs. Opaque Printing Paper, without rag: Mathers-Lamm Paper Company, $.0864; Champion Coated Paper Company, $.0712; Whitaker Paper Company, $.11; D. L. Ward Company, $.115; and Seaman Paper Co., $.0932.

58,000 pounds 38x48—No. 2, 58 lbs. Opaque Printed Paper, rag: Philip Lindemeyr, $.1105 per pound; Whitaker Paper Company, $.11; and D. L. Ward Co., $.115.

The Purchasing Officer of the Government Printing Office will open bids on June 10 for 300,000 pounds of white news print paper in 48 in. rolls, basis of 24x36—32.

The Purchasing Officer of the Government Printing Office will open bids on June 13 for 3,400 pounds (100 reams) of 19x24—34, No. 28 white ledger paper.

The Purchasing Officer of the Government Printing Office will open bids on June 10 for:

190,000 pounds (5,000 reams) 24x38—38. White machine finish printing paper;

76,000 pounds (1,000 reams) 38x48—76. White machine finish printing paper;

67,000 pounds (1,000 reams) 31¼x45½—67. White S. & S. C. printing paper;

6,000 pounds (200 reams) 21x32—30. Wood Manila paper.

Bids will be opened by the Purchasing Officer of the Panama Canal on June 23 for the following paper items:

1,000 reams (500,000 sheets) of 17x22—7¼ unglazed onion skin paper.

1,600 pounds of No. 13 pink bond paper in 17 in. rolls.

3,500 pounds of blue and 3,500 pounds of cherry writing paper in 17 in. rolls.

80 reams (40,000 sheets) of 19x24—No. 28 white ledger paper.

30 reams (15,000 sheets) of 19x24—100 white blotting paper.

The Dill & Collins Co. has been awarded the contract by the Purchasing Officer of the Government Printing Office for furnishing 2,000,000 pounds of U. S. cream bristol postal card board in 44½ in. rolls at .0742 per pound, bids for which were opened on May 23.

The Whiting Paterson Company will furnish 40,000 pounds of manila tag board at .0825 per pound.

The Whitaker Paper Company has been awarded the contract by the Purchasing Officer of the Government Printing Office for furnishing 16,000 pounds (1,000 reams) of 21 x 32—16 white glazed bond paper at $.199 per pound. The same firm will also furnish 12,000 pounds (400 reams) of 21 x 32—30 wood manila paper at $.0585, and the Champion Coated Paper Company will furnish 58,000 pounds (1,000 reams) of opaque printing paper at $.0712 per pound. Bids for these items were opened on June 3.

Dragon Paper Mfg. Co. Opens Boston Office

BOSTON, Mass., June 6, 1921.—The Dragon Paper Manufacturing Company, Inc., has opened an office at 161 Devonshire street in charge of James M. Hayward. He is to take over the entire line of Confectioners Paper Specialties—Waxed Papers, Embossed Seals and Labels, Chocolate Dividers, Chocolate Layers, Diamontine Padding Waxed Papers, Glassine and White Confectionery bags, plain and printed as well as other paper specialties which the firm manufactures.

Diamond Mills Paper Company

44 Murray Street
New York

Est. 1872 **Barclay 6139**

Manufacturers of High Grade Tissue, including the following:

Grass Bleached Tissues
Silk Repp
Plain and Ribbed Cigarette
Train Order Tissue for oiling
White and Colored Carbon Papers
Manila Stereotype
Papers for Nitrating
White, Manila, and Buff Copyings
Manila Tracing Paper
High Grade Sulphite Tissues
Tissues in rolls a specialty

We also operate The American Novelty Paper Co.

Manufacturers of:

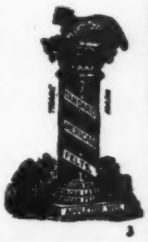
Plain and Decorated Crepe Papers
Plain and Decorated Crepe Napkins

Felts

Made to Suit Your Individual Needs

We manufacture all sizes of Felts and Jackets for all conditions in the paper making industry.

The fact that most of the largest paper mills in America are among our customers is sufficient proof that we can care for your needs.



APPLETON WOOLEN MILLS
Appleton, Wis.

EVERYTHING IN

PULP & PAPER

J. F. PATTON CO., INC.
33 West 42nd St.
New York City

(Cable address - Pulp, N.Y.)

BOOK PULP

"SOMETHING NEW IN PAPER-MAKING"

Our clean, bleached white Book Pulp possesses all the paper-making elements and advantages of bleached sulphite and soda pulp, at a cost slightly higher than that of ground wood pulp. It enables the practical paper-maker to cut costs and create new grades.

New York and Maryland Pulp and Paper Co.
522 Fifth Avenue
New York

MILL—METUCHEN, N. J.

Satisfaction that Grows

Most any machine of passable construction, if reasonably well fitted to its job, will give a degree of satisfaction—at first.

But the real test comes later. There's nothing like long service for establishing beyond question whether a machine has or has not the ability to handle its work satisfactorily.

With the Langston slitter, the longer you use it, the better the results will please you.

In the beginning you are certain to be satisfied with the way the Langston slitter turns out the work.

And this initial satisfaction mounts steadily as you see how the Langston slitter keeps on operating smoothly, continuously, day in day out. You'll appreciate the way it has of stacking up the work—and the dollars, too.

Two generations of hard, every-day experience are built into the Langston slitter. We will be glad to show you, without your incurring the slightest obligation, how well this experience has adapted the Langston slitter to solve the problems you're up against.

SAMUEL M. LANGSTON CO.
CAMDEN, NEW JERSEY, U. S. A.

Langston—for Paper Working Machinery

Hoisting facilities at every point

A Shepard cage-controlled hoist operating on a Shepard transfer crane and suitable monorail track makes accessible every point on a floor.

The crane is run to a point where it connects with monorail track. The hoist can be run from crane track to any one of several monorails which are installed at intervals.

One man, the operator in the overhead traveling cage, controls the entire operation of handling heavy rolls of paper.

Shepard engineers will gladly assist you in laying out an efficient system of rehandling for any mill, large or small.

"Shepard" makes Electric Hoists ½ to 30 tons; Electric Traveling Cranes 1 to 50 tons; and Electric Cargo Handling Equipment for Docks and Ships.

Shepard Electric Crane & Hoist Co.
378 Schuyler Ave., Montour Falls, N. Y.

New York, Boston, Detroit, Philadelphia, Baltimore, Melbourne, Chicago, Cleveland, Montreal, Pittsburgh, San Francisco, London

Member Electric Hoist Manufacturers' Assn.

SHEPARD ELECTRIC CRANES & HOISTS

BAKER MANUFACTURING CORPORATION

Formerly Baker & Shevlin Co.

Manufacturers of

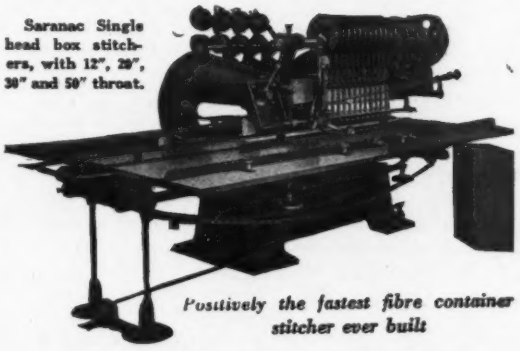
A general line of paper and pulp making machinery including:

Automatic Magazine Grinders (owners of all U. S. patents)
Bronze and White Metal Valves for Sulphite Mills
Bronze and White Metal Pipe and Fittings for Sulphite Mills
Centrifugal Screens—Horizontal and Vertical
Centrifugal Pumps
C. Bache Wiig Barking Drum
Cylinder Moulds
Decker Machines or Pulp Thickeners
Feeney Automatic Stock Regulator
Kneaders
Monarch Diaphragm Screen
Paper Making Machines—Cylinder and Fourdrinier
Paper Machine Screens—Horizontal Rotary
Pulp Refiners
Ramsey Patent Grinder Valves
Sliver Screens
Wet Machines
Winder Shafts
Worm Washers
Worm Knotters

Baker Manufacturing Corporation Saratoga Springs, N. Y.

25 to 40 shipping containers per minute can be made on a

Saranac Automatic Multiple Head Stitcher



Saranac Single head box stitchers, with 12", 20", 30" and 50" throat.

Positively the fastest fibre container stitcher ever built

IT is equipped with twelve stitching heads, so that any number from 1 to 12 staples can be driven at one time. Either a single or double row of staples, or single row with the tie stitch, are automatically driven. It takes less than five minutes to change from the largest to smallest size containers.

Write for Full Particulars.

We also manufacture Bottom Sealing Machines.

Saranac Machine Company

Benton Harbor, Michigan

WE MAKE BEATERS AND JORDANS OF QUALITY

SIX SIZES OF JORDANS, BEATERS, FROM ¾ LBS. TO 3000 LBS.

The Noble & Wood Machine Co., Hoosick Falls, N. Y.

New York Market Review

OFFICE OF THE PAPER TRADE JOURNAL,
WEDNESDAY, June 8, 1921.

With the prospects now in sight for adjustment of labor troubles in the industry and with the railroads cutting wages, in order, it is to be hoped, to lower rates, the outlook for improvement in the paper industry is considerably better than it has been in some time. Affairs in the paper industry have been said to run in cycles. That is, a period of very rapid production is usually followed by a correspondingly long period of stagnation. The real crux of the situation now seems to be the attitude of the buyers. The present slow period is sure to continue until the buyers are convinced that rock bottom is reached. All efforts on the part of manufacturers to hold prices up are futile.

Some of the large producers of sulphite pulp are reported to have made reductions or to be about to make them and this is a good sign. The pulps have been, by force of circumstances, kept up pretty high and the sooner they become stabilized the better. Several of the grades have just about reached the minimum already and are showing signs of bracing up. Soda pulp, however, has remained about the same but the market condition is also unchanged.

Some of the grades of rags have picked up and waste paper is also showing signs of improvement.

Bonds, ledgers and writings have been marking time during the past week although a better demand was noticeable in some quarters. There has been little falling off in price except in some of the poorer grades.

News print, too, has remained about the same in spite of the prophecies that the strike was going to raise the price. There seems now to be no reason to believe that there will be any lack of this grade of paper to supply a normal demand even if the tie-up should continue for a long time.

Tissue is also in comparatively good shape with the price holding firm and a fairly good business being done. This product got down low enough to meet the buyers' demand for a lower price before some of the others and it is therefore well on the road to normal now.

Kraft paper is still quite slow and there appears to be no indication of an immediate improvement. Although the stocks on hand with the consumers are said to be greatly reduced, still there seems to be enough to satisfy their demands for the next month or so. This product is largely dependent upon improvement in the retail business and, as every one knows, prices have not been reduced proportionately in this end. Buying by the public is always slow anyway during the Summer and it will be slower yet if this class of business men do not soon see the wisdom of lowering their prices to meet their customers' demands. Thus a real improvement in wrappings cannot be expected for some little time yet.

Board is reported as on the up-grade now. The price is said to have gone up a little during the past couple of weeks. Dealers are optimistic and say that they believe board is going to outstrip many of the other commodities in the race back to normal.

Mechanical Pulp

In spite of the shut-down in the news print mills, there appears to be a slightly better feeling in the ground wood market. The price is still firm although some lots of very inferior grades, which are largely a gamble to the buyer, are said to be selling for as low as $18 or $20 per ton.

Chemical Pulp

Bleached sulphite seems to have gone down somewhat in price while most of the other grades have remained about the same. The demand is not noticeably better but dealers say they look for an improvement shortly.

Old Rope and Bagging

Old rope and bagging have been about the same during the past week with little change save for a slightly better feeling which is prevalent through the market.

Rags

Rags are reported as being slightly improved this week, even the imported having shown some signs of life. A few large deals have been consummated in dark cottons and it now looks as though this market were going to pick up.

Waste Paper

Hard and soft white shavings are reported as in better demand this week and old krafts are also improved although it is difficult to obtain any. This market is much better and seems to be improving all the time.

Twine

There has been no change in twine during the past week and little worthy of note has occurred. There is a slightly better demand and the belief seems to be that the mills will begin buying again soon.

Imports of Paper Into India

According to figures given in the *Weekly Bulletin of the Department of Trade and Commerce of Canada*, the total imports of printing paper into India for the fiscal year of 1918-19 was 194,603 hundredweight, and for the year 1919-20 the amount was 200,684 hundredweight, of which the United Kingdom supplied 48,410 hundredweight, the United States 46,960 hundredweight, Norway 74,914 hundredweight, and Sweden 29,239 hundredweight. In 1917-18 Japan exported 27,106 hundredweight to India, but in 1920 supplied practically none. The United States and the United Kingdom have largely increased their trade, the former from 17,694 hundredweight and the latter from 26,253 hundredweight, while the trade of Norway and Sweden has slightly diminished.

Printing paper is imported both in rolls and in bales, the larger newspapers taking the former. It is estimated that the import of paper in rolls into India, including Burma, amounts to 4,000 to 5,000 tons per annum. Imports of stationery in the year 1919-20 totaled in value about 4,500,000 rupees, a considerable increase over the previous two years. The bulk of the stationery was from the United Kingdom, which supplied over 2,300,000 rupees worth, while the supply from the United States was valued at 1,300,000 rupees. The import of other kinds of paper amounted in 1919-20 to over 7,500,000 rupees, which is 200,000 rupees more than the previous year and 2,500,000 rupees less than in 1917-18. The import of paste boards, mill board, etc., is of considerable importance, amounting in value to 3,000,000 rupees a year.

Paper Specifications' Report Postponed

[FROM OUR REGULAR CORRESPONDENT.]

WASHINGTON, D. C., June 6, 1921.—The Joint Congressional Committee on Printing at a meeting on Monday and at the request of the Paper Specifications Committee, postponed the date of the report by the Specifications Committee from Monday until June 15, owing to the fact that the Specifications Committee had not had an opportunity to prepare the new specifications for the Government Printing Office for a six months period.

A letter has been received by the Joint Congressional Committee on Printing from the American Paper and Pulp Association calling attention to paper rejections which have recently been made by the Government Printing Office and as a result of the letter it is probable that a conference will be held between members of the Paper Specifications Committee and a representative of the Association.

Market Quotations

Paper Company Securities

New York Stock Exchange closing quotations June 7, 1921:

Stocks.	BID.	ASKED.
American Writing Paper Company, pref.	29	29¼
International Paper Company, com.	60¾	61⅛
International Paper Company, pref., stamped.	71⅜	72
Union Bag & Paper Corporation	—	68

Because of the unusual conditions prevailing in the various markets quotations are more or less nominal.

Paper

F. o. b. Mill.

Ledgers	12	@	30
Bonds	9.50	@	45.00
Writing—			
Extra Superfine	14	@	30
Superfine	14	@	24
Tub Sized	16	@	20
Engine Sized	12	@	21
News—f. o. b. Mill—			
Rolls, contract	5.00	@	6.00
Rolls, transit	5.00	@	5.75
Sheets	6.15	@	6.50
Side Runs	4.00	@	5.00
Book, Cased—f. o. b. N. Y.—			
S. & S. C.	7.75	@	8.75
M. F.	7.50	@	8.50
Coated and			
Enamel	10.50	@	12.50
Lithograph	10.50	@	11.50
Tissues—f. o. b. N. Y.—			
White, No. 1	.85	@	1.10
Colored	1.10	@	2.15
Anti-Tarnish	1.50	@	2.65
Kraft—f. o. b. Mill—			
No. 1 Domestic	7.50	@	8.00
No. 2 Domestic	6.50	@	7.50
Imported	6.50	@	10.00
Sulphite Screenings	4.25	@	4.75
Manila—			
No. 1 Jute	8.00	@	9.00
No. 2 Jute	8.25	@	9.00
No. 1 Wood	5.50	@	6.50
No. 2 Wood	5.25	@	6.25
Butchers	5.00	@	6.00
Fibre Papers—			
No. 1 Fibre	6.00	@	7.00
No. 2 Fibre	5.00	@	6.00
Common Bogus	3.00	@	4.00
Card Middles	5.50	@	6.00
Boards—per ton—			
News	40.00	@	45.00
Straw	40.00	@	45.00
Chip	35.00	@	40.00
Binders' Board	80.00	@	90.00
Sgl.Mla.Ld.Chip	60.00	@	65.00
Wood Pulp	100.00	@	110.00
Container	60.00	@	65.00

Mechanical Pulp

(F. o. b. Pulp Mills.)

No. 1 f. o. b. Mill	26.00	@	35.00

Chemical Pulp

(Ex-Dock, New York.)

Sulphite (Foreign)—			
Bleached	nominal	@	7.00
Easy Bleaching	4.75	@	5.75
No. 1, unbl'chd	3.75	@	4.75
No. 2 unbl'chd	3.00	@	3.75
Kraft (Foreign)	nominal	@	3.75
Sulphate—			
Bleached	nominal	@	5.25
(F. o. b. Pulp Mill.)			
Sulphite (Domestic)—			
Bleached	nominal	@	6.50
Strong Unbl'chd	3.65	@	4.00
Easy Bleaching			
Sulphite	3.75	@	4.00
News Sulphite	3.60	@	3.90
Mitscherlich	3.90	@	4.25
Kraft (Domestic	3.35	@	3.75
Soda bleached	nominal	@	6.00

Domestic Rags

New

Prices to Mill, F. o. b. N. Y.

Shirt Cuttings—			
New White, No. 1	9.00	@	9.50
New White, No. 2	6.50	@	7.00
Silesias, No. 1	6.00	@	6.50
New Unbleached	7.50	@	8.00
Washables	5.25	@	5.75
Fancy	6.00	@	6.50
Cottons—according to grades—			
Blue Overall	6.25	@	6.75
New Blue	6.00	@	6.25
New Black Soft	3.25	@	3.75
New Light Seconds	3.00	@	3.25
Khaki Cuttings	3.50	@	4.00
Corduroy	3.25	@	3.50
New Canvas	8.00	@	8.50
New Black Mixed	2.75	@	3.00
Old White, No. 1—			
Repacked	5.50	@	6.00
Miscellaneous	4.50	@	5.00
White, No. 2—			
Repacked	3.25	@	3.75
Miscellaneous	2.75	@	3.00
St. Soiled White	1.15	@	1.35
Thirds and Blues—			
Repacked	1.75	@	2.00
Miscellaneous	1.25	@	1.50
Black stockings	1.85	@	2.15
Cloth Strippings	.95	@	1.05
No. 1	.95	@	1.05
No. 2	.80	@	.90
No. 3	.95	@	1.05
No. 4	.60	@	.70
No. 5A	1.00	@	1.10
B	.65	@	.75
C	.30	@	.40

Foreign Rags

New Light Silesias	7.00	@	8.00
Light Flannelettes	7.50	@	9.50
Unbl'ch'd Cottons	10.00	@	12.00
New White Cuttings	10.00	@	12.00
New Light Oxfords	7.00	@	8.00
New Light Prints	6.00	@	7.00
New Mixed Cuttings	3.00	@	5.00
New Dark Cuttings	1.75	@	2.50
No. 1 White Linens	9.00	@	11.00
No. 2 White Linens	8.00	@	9.00
No. 3 White Linens	6.00	@	7.00
No. 4 White Linens	4.00	@	4.50
Old Extra Light Prints	2.75	@	3.00
Ord. Light Prints	2.25	@	2.50
Med. Light Prints	1.75	@	2.00
Dutch Blue Cottons	2.00	@	2.25
German Blue Cottons	1.75	@	2.00
Ger. Blue Linens	3.00	@	3.25
Checks and Blues	1.75	@	2.00
Dark Cottons	1.00	@	1.15
Shoppery	.85	@	.95
French Blues	2.00	@	2.25

Bagging

Prices to Mill F. o. b. N. Y.

Gunny No. 1—			
Foreign	1.10	@	1.25
Domestic	1.25	@	1.35
Wool, Tares, light	1.25	@	1.35
Wool, Tares, heavy	1.35	@	1.50
Bright Bagging	1.20	@	1.30
No. 1 Scrap	1.00	@	1.05
Sound Bagging	1.00	@	1.05
Manila Rope—			
Foreign	4.00	@	4.25
Domestic	4.00	@	4.25
New Bu Cut	2.50	@	2.75
Hessian Jute Threads—			
Foreign	4.25	@	4.50
Domestic	4.00	@	4.25
Mixed Strings	1.00	@	1.25

Twines

Cotton— (F. o. b. Mill)			
No. 1	22	@	23
No. 2	19	@	20
No. 3	18	@	19
India, No. 6 basis—			
Light	18	@	19
Dark	17	@	18
B. C., 18 Basis	39	@	40
A. B. Italian, 18 Basis	50	@	60
Finished Jute—			
Light, 18 basis	26	@	27
Dark, 18 basis	24	@	25
Jute Wrapping, 2-6 Ply—			
Extra No. 1	26	@	27
No. 1	25	@	26
No. 2	23	@	24
Tube Rope—			
5-ply and larger	17	@	18
Fine Tube Yarn—			
5-ply and larger	30	@	32
4-ply	31	@	33
3-ply	32	@	34
Unfinished India—			
3-ply and larger	16	@	17
Paper Makers Twine Balls	10½	@	12½
Box Twine, 2-4 ply	14	@	16
Jute Rope	20	@	24
Amer. Hemp, 6	32	@	34
Sisal Hay Rope—			
No. 1 Basis	19	@	22
No. 2 Basis	18	@	20
Sisal Lath Yarn—			
No. 1	18	@	19
No. 2	17	@	19
Manila Rope	26	@	28

Old Waste Papers

(F. o. b. New York.)

Shavings—			
Hard White, No. 1	3.25	@	3.50
Hard White No. 2	2.50	@	2.75
Soft White, No. 1	2.25	@	2.50
Colored, No. 1	1.00	@	1.25
Flat Stock—			
Stitchless	1.10	@	1.20
Over Issue Mag.	1.15	@	1.25
Solid Flat Book	.90	@	1.00
Crumpled No. 1	.80	@	.85
Solid Book Ledger	1.60	@	1.75
Ledger Stock	1.25	@	1.50
No. 1 White, New	1.40	@	1.60
New B. B. Chips	.45	@	.50
Manilas—			
New Env. Cut	2.85	@	3.15
New Cut, No. 1	1.75	@	2.00
Extra No. 1, Old	1.00	@	1.10
Print	.65	@	.75
Container Board	.45	@	.55
Bogus Wrappers	.60	@	.70
Old Krafts, machine compressed Bales	1.80	@	2.00
News—			
Strictly Overissue	.60	@	.70
Strictly Folded	.45	@	.50
No. 1 Mixed Paper	.30	@	.35
Common Paper	.20	@	.25

CHICAGO

[FROM OUR REGULAR CORRESPONDENT.]

Paper

F. o. b. Mill.

All Rag Bond	40	@	—
No. 1 Rag Bond	30	@	40
No. 2 Rag Bond	20	@	30
Water Marked Sulphite	14	@	16
Sulphite Bond	11	@	13
Sulphite Ledger	18	@	—
Superfine Writing	26	@	33
No. 1 Fine Writing	22	@	30
No. 2 Fine Writing	20	@	27
No. 3 Fine Writing	15	@	18
No. 1 M. F. Book	7½	@	8¼
No. 1 S. & S. C. Book	8	@	9
Coated Book	10½	@	16
Coated Label	10½	@	14
News—Rolls, mill	5	@	5¼
News—Sheets, mill	5½	@	6¼
No. 1 Manila	6½	@	7
No. 1 Fibre	6¼	@	7
No. 2 Manila	5¼	@	6
Butchers' Manila	5½	@	5¼
No. 1 Kraft	8	@	8½
No. 2 Kraft	7	@	7½
Wood Tag Boards	5½	@	6
Screenings	4	@	4½
Boards, per ton—			
Plain Chip	35.00	@	40.00
Solid News	40.00	@	50.00
Manila Lined Chip	60.00	@	70.00
Container liner			
85 Test	60.00	@	—
100 Test	70.00	@	—
Solid Wood Pulp	—	@	—
Straw Board	35.00	@	45.00
Filled Pulp Board	—	@	—

Old Papers

Shavings—			
No. 1 Hard White	2.25	@	2.50
No. 1 Soft Shav.	1.75	@	2.00
No. 1 Mixed	.60	@	.75
No. 2 Mixed	.60	@	.75
White Envel. Cutting	2.25	@	2.50
Ledgers and Writings	1.40	@	1.50
Solid Books	1.10	@	1.20
No. 1 Books, light	.75	@	.85
Blanks	1.25	@	1.35
Ex. No. 1 Manila	1.60	@	1.75
Manila Envelope Cutting	1.65	@	1.75
No. 1 Manilas	.85	@	.90
Folded News (over issue)	.70	@	
Old Newspaper	.50	@	.55
Mixed Papers	.40	@	.50
Straw Clippings	.40	@	.50
Binders' Clippings	.40	@	.50
Kraft	1.65	@	
New Craft Cuts	1.75	@	1.85
Roofing Stock, f.o.b. Chicago, Net Cash—			
No. 1	18.00	@	—
No. 2	16.00	@	—
No. 3	14.00	@	—
No. 4	14.00	@	—

PHILADELPHIA

[FROM OUR REGULAR CORRESPONDENT.]

Paper

Bonds	.10	@	.60
Ledgers	.15	@	.40
Writings—			
Superfine	.15	@	.20
Extra fine	.12	@	.22
Fine	.20	@	.30
Fine, No. 2	.20	@	.25
Fine, No. 3	.15	@	.20
Book, M. F.	.06	@	.09
Book, S. S. & C.	.08	@	.15
Book, Coated	.08	@	.15
Coated Lithograph	.10	@	.15
Label	.08	@	.15
News	.05	@	.07
No. 1 Jute Manila	.18	@	.18½
Manila Sul., No. 1	.09½	@	.10
Manila No. 2	.08½	@	.09
No. 2 Kraft	—	@	.07
No. 1 Kraft	—	@	.08
Common Bogus	.02	@	.03½
Straw Board	35.00	@	45.00
News Board	40.00	@	45.00
Chip Board	30.00	@	35.00
Wood Pulp Board	90.00	@	100.00
(Carload Lots.)			
Binders Boards—			
Per ton	$65.00	@	75.00
Carload lots	60.00	@	65.00
Tarred Felts—			
Regular	75.00	@	80.00
Slaters	80.00	@	85.00
Best Tarred, 1-ply (per roll)	2.00	@	2.10
Best Tarred, 2-ply (per roll)	1.50	@	1.60
Best Tarred, 3-ply	2.00	@	2.10

Bagging

F. o. b. Phila.

Gunny No. 1—			
Foreign	2.25	@	2.50
Domestic	1.75	@	2.00
Manila Rope	4.50	@	4.75
Sisal Rope	2.00	@	2.50
Mixed Rope	2.00	@	2.25
Scrap Burlaps	1.00	@	1.25
Wool Tares, heavy	2.50	@	2.75
Mixed Strings	2.00	@	2.25
No. 1, New Lt. Burlap	7.50	@	8.00
New Burlap Cuttings	5.00	@	5.25

Old Papers

F. o. b. Phila.

Shavings—			
No. 1, Hard White	4.50	@	5.00
No. 2, Hard White	4.00	@	4.50
No. 1 Soft White	3.00	@	3.50
No. 2 Soft White	2.00	@	2.25
No. 1 Mixed	1.50	@	1.75
No. 2 Mixed	.75	@	1.00

(Continued on page 98)

Imports and Exports of Paper and Paper Stock

NEW YORK, BOSTON, PHILADELPHIA AND OTHER PORTS

NEW YORK IMPORTS

WEEK ENDING JUNE 4, 1921.

News Print.....156 reels.
Printing Paper.....11 cs.
Writing Paper.....21 cs.
Cigarette Paper.....2,041 cs.
Filter Paper.....16 cs., 208 bls.
Drawing Paper.....13 cs.
Colored Paper.....13 cs.
Grass Wall Paper.....40 cs.
Paper Hangings.....31 bls., 6 cs.
Wrapping Paper.....1,787 bls.
Packing Paper.....866 rolls
Paper Bags.....778 cs.
Straw Paper.....10 rolls.
Photo Paper.....4 cs.
Litho Paper.....50 cs.
Miscellaneous Paper.....3 bls. 96 cs.

CIGARETTE PAPER.

R. J. Reynolds Tobacco Co., Consort, Bordeaux, 1,030 cases.
P. J. Schweitzer, by same, 90 cases.
American Tobacco Co., by same, 600 cases.
American Tobacco Co., Monadnock, Bordeaux, 300 cases.
Liggett & Myers Tobacco Co., by same, 16 cs.
H. Konetian, M. Hellas, Piraeus, 2 cases.
A. Orlich, N. Amsterdam, Rotterdam, 3 cases.

FILTER PAPER.

J. Manheimer, Monadnock, Bordeaux, 99 bls.
E. Fougera & Co., by same, 96 bls.
H. Kayser, Fils, by same, 13 bls.
H. Kayser, Fils, by same, 1 cs.
H. Reeve-Angel & Co., Michigan, London, 10. cs.
H. Reeve-Angel & Co., Mesaba, London, 5 cs.

DRAWING PAPER.

H. Reeve-Angel & Co., Mesaba, London, 1 cs.
H. Reeve-Angel & Co, Michigan, London, 8 cs.
Nat'l City Bank, Mongolia, Hamburg, 4 cs.

COLORED PAPER.

Nat'l City Bank, Zeeland, Antwerp, 13 cs.

GRASS WALL PAPER.

Bech, Van Siclen & Co., Amazon Maru, Kobe, 19 cs.
R. F. Downing & Co., by same, 21 cs.

PAPER HANGINGS.

W. H. S. Lloyd & Co., Mesaba, London, 5 cs.
W. H. S. Lloyd & Co., Michigan, London, 1 cs.
W. H. S. Lloyd, by same, 7 bls.
A. C. Dodman, Jr., Co., Mahopac, Liverpool, 24 bls.

WRAPPING PAPER.

Poland Paper Co., Drottningholm, Gothenburg, 1,789 bls.

PACKING PAPER.

Republic Bag & Paper Co., East Cape, Hamburg, 866 rolls.

PAPER BAGS.

Ford of France, Inc., Northwestern Miller, Havre, 778 cs.

STRAW PAPER.

U. S. Forwarding Co., Mystic, Hamburg, 10 rolls.

PHOTO PAPER.

Pitt & Scott, Ltd., Mesaba, London, 4 cs.

PRINTING PAPER.

Chas. Scribner & Sons, Mesaba, London, 2 cs.
Carl Steiner, East Cape, Hamburg, 9 cs.

WRITING PAPER.

Tamm & Co., L. Luckenbach, Rotterdam, 21 cs.

NEWS PRINT.

Hart Trading Co., Toledo Bridge, Kristiania, 156 reels.

LITHO PAPER.

Fuchs & Lang Mfg. Co., Amazon Maru, Hongkong, 50 cs.

PAPER.

Japan Paper Co., Amazon Maru, Kobe, 88 cs.
H. Kayser, Fils, Lafayette, Havre, 8 cs.
Windsor & Newton, Michigan, London, 3 bls.
To Philadelphia, Pa.:

NEWS PRINT.

Chemical Nat'l Bank, Toledo Bridge, Kristiania, 930 reels.
To Chicago, Ill.

FILTER PAPER.

A. Daigger & Co., Drottningholm, Gothenburg, 1 cs.

RAGS, BAGGING, ETC.

P. Berlowitz, Monadnock, Bordeaux, 237 bls. rags.
Equitable Trust Co., by same, 51 bls. rags.
Castle, Gottheil & Overton, by same, 530 bls. rags.
A. J. Morris, Northwestern Miller, Havre, 6 bls. rags.
Equitable Trust Co., by same, 400 bls. rags.
Guaranty Trust Co., Romeo, Manchester, 203 bls. bagging.
Guaranty Trust Co., by same, 131 bls. hide cuttings.
State Bank, East Cape, Hamburg, 145 bls. rags.
Salomon Bros., & Co., by same, 296 bls. rags.
Salomon Bros., & Co., by same, 161 bls. thread waste.
W. Hughes & Co., Ansaldo, San. Giorgio III, Genoa, 74 bls. cotton waste.
Railway Manufacturers Supply Co., by same, 105 bls. cotton waste.
Royal Manufacturing Co., Masilia, Genoa, 87 bls. cotton waste.
E. J. Keller Co., Northwestern Miller, Havre, 124 bls. bagging, 87 bls. new cuttings, 99 bls. rags.

OLD ROPE.

Old Colony Trust Co., Monadnock, Bordeaux, 149 coils.
First Nat'l Bank of Boston, Galileo, Antwerp, 267 coils.
Int'l Purchasing Co., Northwestern Miller, Havre, 180 coils.
E. J. Keller Co., Northwestern Miller, Havre, 90 bls. rope.

CHINA CLAY.

Luke Knowles, Chicago City, Bristol, 200 tons, bulk.
G. Knowles & Son, by same, 169 tons, 10 cwt., bulk.
Moore & Munger, by same, 102 tons, bulk.
Paper Makers Chemical Co., by same, 191 tons, bulk.
Moore & Munger, Rovuma, Fowey, quantity in bulk.

CASEIN.

T. M. Duche Sons, Oaamings, Buenos Aires, 2,600 bags.
T. M. Duche Sons, Camoens, Buenos Aires, 1,700 bags.
T. M. Duche Sons, Sagoporack, Buenos Aires, 1,667 bags.

WOOD PULP.

Nat'l Bank of Commerce, Drottningholm, Gothenburg, 287 bls. dry chemical pulp.

BOSTON IMPORTS

WEEK ENDING JUNE 4, 1921.

Moore & Munger, Rovuma, Fowey, china clay, quantity in bulk.
English China Clay Sales Corp., by same, china clay, quantity in bulk.

NEW ORLEANS IMPORTS

WEEK ENDING JUNE 4, 1921.

Castle, Gottheil & Overton, Kentucky, Rouen, 864 bls. rags.

PHILADELPHIA IMPORTS

WEEK ENDING JUNE 4, 1921.

Castle, Gottheil & Overton, Storm King, Antwerp, 330 bls. rags.

Paper and Prohibition

PARIS, May 20, 1921.—France is buying paper, pulp and cellulose only from, those countries which, in return, buy French wines and liquirs. Countries which prohibit alcohol have to pay a prohibitive duty on the products they want to send into France. For instance, Sweden admits French wines and liquors. Sweden is permitted to ship paper at a rate of 300 and 600 francs per ton into France. Finland, on the other hand, a prohibition country excluding French wines and liquors, has to pay 1,200 and 2,400 francs duty on the same quality of paper per ton. Norway is in the same predicament as Finland. Norway prohibits French alcohol and France prohibits Norwegian paper and pulp.

Finland is practically excluded from the French market. It exported, in 1920, pulp worth 26,700,000 marks, cellulose worth 20,000,000 and paper worth 24,000,000 marks to France.

No wonder Finnish agents are here clamoring for a trade treaty to be entered into between both countries. Most of those Finnish agents are representing Finish saw mills, pulp mills and paper mills. As long as there is no treaty, the French Government can treat Finland as she feels like. It is said in Government circles there is little chance of a change in the Government's attitude towards Finnish exporters as long as Finland maintains prohibition of alcohol.

The Finnish pulp and paper industry is suffering from general depression, the same as the rest of the world. This exclusion from the French market, of course, adds to the sting.

Who Can Answer These Questions?

A subscriber wishes the PAPER TRADE JOURNAL to put the following questions to its subscribers:

"On an order of Glassine paper ordered to weigh 14 lbs. per 500 sheets at say 24 cents per lb., the delivered paper weighs more than 14 lbs. per ream, but the overweight does not exceed the allowance made by the paper trade rules.

"Is it correct in this case to invoice the delivered weight or should the invoice only be for the ordered weight.

"Is it admissible that the principle of charging newspaper on reels 'gross for net' can be stretched to cover even the wooden packing of the reels?

"In other words, if reels are packed in wood crates is it admissible that the wood used can be charged at the pound price for paper?"

HAWKESBURY

BLEACHED SULPHITE

Makes Book Paper
of distinction at
competitive prices.

RIORDON SALES COMPANY
LIMITED
MONTREAL **CANADA**

CABLES "RIORDON" MONTREAL

T. J. Stevenson SALES MANAGERS *Geo. E. Challes*

Miscellaneous Markets

OFFICE OF THE PAPER TRADE JOURNAL.
WEDNESDAY, June 8, 1921.

Although on the surface of things the chemical market remains about the same this week, in reality the outlook is much more hopeful. There have been no further downward revisions of price and a slightly better demand has been noticeable. The heavy chemicals in particular appear to be a little brisker, although this is probably attributable to conditions which have transpired outside of the paper industry. Buying is still far from normal, but dealers appear to believe that this period of hand to mouth buying will come to an end with the hot months. On the whole, things are looking toward the best and there is no cause to be down-hearted.

ALUM—Alum remained just about the same during the past week with no change either upward or downward. The price is firm with the lump selling at from 4.00 to 4.50 cents per pound, ground at 4.50 to 5.00 cents, and the powdered from 5.00 to 5.50 cents per pound.

BLANC FIXE—Buyers are showing slightly improved interest in blanc fixe but on the whole this product remains pretty quiet. The paste is selling for about 2 cents per pound and the powdered for about 3 cents per pound.

BRIMSTONE—Little worthy of note has occurred in the brimstone market during the past week. The price is still firm at $16 per ton.

CHINA CLAY—China clay has been marking time during the week with little real change either in the domestic or in the foreign situation. The price remains at about $6 to $7 per ton for the domestic unwashed, $9 to $10 for the domestic washed and $12 to $24 per ton for the English, depending upon the grade required.

CASEIN—Casein is still very quiet with the price largely dependent upon the individual deal. There is said to be a good deal of this stock on hand at the mills and the demand has not shown much sign of bracing up. The price is around 8 to 10 cents per pound.

CAUSTIC SODA—Caustic soda, like some of the other heavy chemicals, is looking a little better this week. Several large deals have been made and the price appears pretty firm at 3.25 to 4.10 on the basis of 60 per cent.

ROSIN—Rosin is still about the same as last week with the price at about $6.50 to $6.60 on grade E, F and G.

SALTCAKE—Saltcake is still in poor demand with the price ranging from $18 to $24 per ton.

SATIN WHITE—Satin white is also about the same with the price about 2.10 cents per pound.

SODA ASH—This product has shown some little improvement this week and the buyers are evincing considerably more interest. The supply is fairly good and buyers seem to expect a good business in a short time. The price is still at about 1.90 to 2.10 on a basis of 58 per cent.

SULPHATE OF ALUMINA—Alumina sulphate is also in better demand and manufacturers seem to be more cheerful than ever before. Business is by no means back to normal but they seem to believe that the prospects are good. The price on the commercial grade is at 2.00 to 2.25 cents per pound and the iron free at 2.75 to 3.25 cents.

TALC—The price of talc is still holding firm with little change in the general market condition. It is quoted at about $18 per ton although it is reported that there is some around which can be had more cheaply.

Market Quotations

(*Continued from page 95*)

Solid Ledger Stock.	2.50	@	2.75
Writing Paper	2.00	@	2.25
No. 1 Books, heavy	1.50	@	1.75
No. 2 Books, light.	1.00	@	1.25
No. 1 New Manila.	3.00	@	3.25
No. 1 Old Manila..	1.25	@	1.50
Container Manila..	.75	@	.80
Old Kraft	2.50	@	3.00
Overissue News....	.90	@	1.00
Old Newspaper	.50	@	.60
No. 1 Mixed Paper.	.50	@	.60
Common Paper	.35	@	.40
Straw Board, Chip.	.50	@	.60
Binders' Bd. Chip..	.50	@	.60

Domestic Rags—New
Price to Mill, f. o. b. Phila.

Shirt Cuttings—			
New White, No. 1	.10	@	.11
New White, No. 2	.08	@	.08½
Silesias, No. 1...	.07½	@	.07¾
New unbleached..	.08½	@	.09½
Washables	.04¾	@	.05
Fancy	.07¾	@	.07¾
Cottons—according to grades—			
Blue Overall	.06½	@	.07
New Blue	.03¼	@	.03¼
New Black Soft	.04¼	@	.04¼
New Light Seconds	.03	@	.03½
Khaki Cuttings...	.04	@	.04½
Corduroy	.02¾	@	.03
New Canvas ...	.08	@	.08½
New Black Mixed	4.15	@	4.25

Old

White, No. 1—			
Repacked	.06	@	.07½
Miscellaneous ...	.06¾	@	.07¼
White, No. 2—			
Repacked	.04¼	@	.04¾
Miscellaneous ...	.03½	@	.04
Thirds and Blues—			
Repacked	.02¼	@	.02½
Miscellaneous ...	.01½	@	.01¾
Black stockings...	2.50	@	2.75
Roofing Stock—			
No. 1.....	.90	@	1.00
No. 2.....	.80	@	.90
No. 3.....	.70	@	.80
No. 4.....	.75	@	.85
No. 5A.....	Nominal		
B.....	Nominal		
C.....	Nominal		

BOSTON

[FROM OUR REGULAR CORRESPONDENT.]

Paper

Bonds	.07½	@
Ledgers	.08½	@
Writings—		
Superfine	.12	@
Fine	.10	@
Books, S. & S. C.	.07	@
Books, M. F.....	.06½	@
Books, Coated.....	.11	@
Label	.09½	@
News, Sheets.....$6.50		@
News, Rolls.....	.05¾	@
Manilas—		
No. 1 Manila....$7.00		@
No. 1 Fibre..... 8.00		@
No. 1 Jute..... 8.00		@
Kraft Wrapping.... 8.00		@
Common Bogus.... 3.00		@

Boards

(Per ton f. o. b. mill.)

Chip $32.50		@
News, Vat Lined. 36.50		@
Wood, Vat Lined. 45.00		@
Filled News Board 37.50		@
Solid News Board. 40.00		@
S. Manila Chip... 55.00		@
Pat. Coated..... 75.00		@

Old Papers

Shavings—			
No. 1 Hard White	.02¾	@	
No. 1 Soft White	.02¼	@	.02½
No. 1 Mixed....	.01¼	@	
Ledgers & Writings	.01½	@	
Solid Books.....	.01	@	
Blanks	.01½	@	
No. 2 Books, Light	.80	@	
No. 1 Manila.....	.01	@	
Folded News (overissues) $14.00		@	
Mixed Paper..... 5.00		@	
Gunny Bagging....	.90	@	1.00
Manila Rope.....	.04	@	
Common Paper.... 4.00		@	
Container Manila..12.00		@	
Old News..... 5.00		@	
Old Kraft..... 1.20		@	

TORONTO

[FROM OUR REGULAR CORRESPONDENT.]

Paper

(Mill Prices to Jobbers f. o. b. Mill)

Bond—			
Sulphite	15	@	—
Light tinted	16	@	—
Dark tinted.....	17½	@	—
Ledgers	17	@	—
Writing	13¼	@	16½
News, f. o. b. Mills—			
Rolls (carloads)..	5.50	@	—
Sheets (2 tons or over)	6.00	@	—
Sheets (less than 2 tons)	6.25	@	—
Book—			
No. 1 M. F. (carloads) 12.00		@	—
No. 2 M. F. (carloads) 11.00		@	—
No. 3 M. F. (carloads) 10.00		@	—
No. 1 S. C. (carloads) 12.50		@	—
No. 2 S. C. (carloads) 11.50		@	—
No. 1 Coated and litho. 16.35		@	—
No. 2 Coated and litho. 15.35		@	—
No. 3 Coated and litho. 14.60		@	—
Coated and litho., colored 16.75		@	—
Wrapping—			
Grey	5.50	@	—
White Wrap	6.00	@	—
"B" Manila	6.50	@	—
No. 1 Manila....	9.00	@	—
Fibre	8.50	@	—
Kraft, M. F. or M. G. 10.00		@	—

Pulp

(F. o. b. Mill)

Ground Wood.....$30.00		@	45.00
Sulphite, easy bleaching	80.00	@	85.00
Sulphite, news grade.	80.00	@	85.00
Sulphite, bleached....120.00		@	125.00
Sulphate	70.00	@	75.00

Old Waste Papers

(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut..	2.25	@	—
Soft White Book Shavings	2.25	@	—
White Bl'k News	1.35	@	—
Book and Ledger—			
Flat Magazine and Book Stock (old)	1.20	@	—
Light and Crumpled Book Stock	1.00	@	—
Ledgers and Writings	1.80	@	—
Solid Ledgers....	1.80	@	—
Manilas—			
New Manila Cut.	2.00	@	—
Printed Manilas.	.80	@	—
Kraft	2.25	@	—
News and Scrap—			
Strictly Overissue	.85	@	—
Folded News....	.75	@	—
No. 1 Mixed Papers	.50	@	—

Domestic Rags—
Price to mills, f.o.b. Toronto.

	Per lb.		
No. 1 White shirt cuttings	.09	@	.09½
No. 2 White shirt cuttings	.06	@	—
Fancy shirt cuttings	.06	@	.06½
No. 1 Old whites	.04	@	
Thirds and blues	.02	@	—
	Per cwt.		
Black stockings..	2.00	@	—
Roofing stock			
No. 1	1.25	@	—
No. 2	1.10	@	—
Roofing stock			
Manila rope.....	.04	@	
No. 2	.01½	@	—
Gunny bagging	.02¼	@	—

The Home of Quality

FACTORY
132ND TO 133RD ST & BROOK AVE

PAPER BAGS

Sacks and Specialties

ESTABLISHED 1901

SCHORSCH & CO.

Manufacturers

500 East 133d Street : New York

This Registered Trade Mark Octagon

on a Paper Bag Vouches for Its Good Quality

Buchanan & Bolt Wire Company

ESTABLISHED 1878 AT HOLYOKE, MASS.

Makers of Highest Grade Fourdrinier Wires, Dandy Rolls, Cylinder Covers, Brass Wire Cloth of all Meshes for Paper, Pulp and Coating Mills—Quality Guaranteed

We make a specialty of Fine Wires for Magazine and Book Papers

Felt Test—Lowest Cost per Ton

If you judge felt values, not by what you put into the equipment, but what you get out of it—then you will specify ORR 3 stripe Endless Felts, for ORR felts will produce the lowest cost per ton. They "stand up" under severe usage. Orr durability is acknowledged everywhere. Their strength and long life are as dependable as their reliability and quality.

In the 32 grades of Felts and Jackets we can match your most exacting demands. Tell us the kind of paper you desire to make, and we will send you samples of felts that will economically serve you and help you to produce paper at lowest cost per ton.

THE ORR FELT & BLANKET COMPANY, Piqua, Ohio

CONSOLIDATED PAPER BAG CO.

General Offices:
125 Merrimac St., Boston, Mass.

Factory:
Somerville, Mass.

Manufacturers of

PAPER BAGS and SACKS of EVERY DESCRIPTION

Samples submitted on request **Inquiries Solicited**

WANT AND FOR SALE ADVERTISEMENTS

CLASSIFIED RATES

Minimum rate for advertisements of 25 words or less, first insertion, $1.00.

SITUATION WANTED, 4 cents a word for first insertion and 2 cents a word for each subsequent insertion of same ad. No ad of less than 25 words accepted.

HELP AND MISCELLANEOUS WANTS, and small For Sale Ads, 4 cents a word for each and every insertion. No ads of less than 25 words accepted.

When answering advertisements, please address the Box Number given in ad.

Answers can be forwarded care Paper Trade Journal, and will be promptly forwarded without extra charge. All should be sent to the New York office, 10 East 39th street. And all should be addressed as the advertisement directs in every case and not simply to the paper.

All classified ads for the current issue must be in hand not later than Monday preceding date of publication.

HELP WANTED

SPECIALIST AGENTS wanted to represent us in U. S. A. Bronze Powders and Imitation Gold Leaves. Caplain Saint Andre Fils & Cie., 8-10-12, Rue Portefoin, Paris, France.

EXPERIENCED SALESMAN wanted to sell paper bags to the jobbing trade. An exceptionally fine opportunity for man of integrity and ability. All communications held strictly confidential. Address, Box 4121, care Paper Trade Journal. tf

SALESMAN WANTED to sell Paper Bag specialties to the wholesale trade and large consumers. Only man with first class following need apply. All communications held strictly confidential. Address, Box 4122, care Paper Trade Journal. tf.

SALESMEN EXPERIENCED, calling on Printing and Publishing Trade in Greater New York. For those that can procure mill orders on all grades of paper and can quickly dispose of "SPECIAL LOTS," we have an attractive proposition. Address, Box 4202, care Paper Trade Journal. J-9

WANTED—Boss machine tender for container board mill. State age and experience and give reference in first letter. Address, Box 4203, care Paper Trade Journal. J-16

WANTED—Established Stationery firm entering Paper and Twine business, desires services of high class salesman who controls some New York City Trade. Commission basis. Drawing account given after qualifications are shown. Address, Box 4217, care Paper Trade Journal. J-9

WANTED—First class millwright. Must be practical on water wheels and pulp and paper mill work. Apply immediately. Box 4183, care Paper Trade Journal. J-9

3 BEATERMEN WANTED. Must be good on colors and all grades of papers. Address, Box 4192, care Paper Trade Journal. J-30

WANTED—Beater Engineer on Book Machine. Mill located near New York City. Address, Box 4218, care Paper Trade Journal. J-16

YOUR OPPORTUNITY

Wanted—TWO FIRST CLASS SALESMEN. MUST BE ABLE TO SELL PAPER BAGS and TOILET PAPER. One with Headquarters at Chicago and one to travel Eastern Territory. Salary commensurate with your ABILITY. H. Norwood Ewing Co., Woolworth Building, New York City. tf

HELP WANTED

IF YOU ARE A TRIED SALESMAN, ambitious; want the pick of the trade and unrestricted opportunity, we invite you to call for a personal talk with our Mr. Blanch. We are a relatively small, but a good, growing concern. Our credit first rate. Mill connections, the very best available on book papers, coated and other grades. Prudential Paper Co., 177 Mulberry St., New York City. J-9

SALESMEN, calling on Jobbing and Wholesale Paper, Woodenware, Printing and Advertising Novelty Trades, as well as those selling to Department, Syndicate and Chain Stores, to sell our advertised line of plain and printed Paper Shopping Bags. Pocket samples. Full or part time on commission basis. Address, Box 4228, care Paper Trade Journal. J-9

SITUATIONS WANTED

SUPERINTENDENT, now employed, would like to make change. Understands thoroughly the manufacture of container, chip, box boards and Fourdrinier specialties. Good on construction, repairs and installation of all kinds of machinery connected with paper mill. Can give the best of reference as to my ability to get production and organize and handle help. Address, Box 4231, care Paper Trade Journal. J-23

SULPHITE SUPERINTENDENT, with long and wide experience, desires position. Quantity and quality of Sulphite Pulp assured, also economy in materials, machinery and labor expense. Strong Sulphite Pulp a specialty, also easy bleaching Pulp. Am familiar with all kinds of Pulpwood and also Lime Rock (Tower) and milk of Lime; Acid system. First class references. Address, Box 4230, care Paper Trade Journal. J-16

YOUNG MAN, 27 years of age, who has a practical knowledge of paper manufacture, and experience with all grades of fine and coarse papers, together with several years sales experience desires position with manufacturer or jobber—preferably one doing export business. Am good executive and correspondent and considerably experienced in exporting and thoroughly acquainted with requirements of Mexico, Cuba, and Latin America. Can handle all export details if desired. Am now studying Spanish. In replying please be specific in first letter, stating just what you have in mind or to offer, salary expected to pay. Am open for position immediately and will go anywhere. Am single. Address, Box 4223, care Paper Trade Journal. J-9

SUPERINTENDENT, now employed, desires to make change. Well up on all grades of board and specialties. Thoroughly familiar with all repairs and general upkeep of mill. Address, Box 4224, care Paper Trade Journal. J-30

CYLINDER MACHINE Tender is open for position; good on all grades of stock. Never been in any labor trouble. Will go anywhere. Address, Box 4227, care Paper Trade Journal. J-23

MAN, WITH LARGE EXPERIENCE selling Wrapping Paper to Factories and Jobbers in Virginia, North and South Carolina, wishes to represent direct. Manufacturer of Kraft Paper 25-lb. and up, Fibre Paper 30 lb. and up, Machine Glazed White, 23 lb. up and Screenings. No answer to agents. Address, "Overstocked," P. O. Box 871, Norfolk, Va. J-23

SUPERINTENDENT open for engagement. Well up on High Grade Bonds & Ledger or Book Papers. Good following of help. Best of references. Communications treated confidentially. Address, Box 4220, care Paper Trade Journal. J-30

WANTED—Position as Machine Tender. Twelve years' experience on Test and Combination Boards. Address, Box 4205, care Paper Trade Journal. J-9

SITUATIONS WANTED

AGGRESSIVE, energetic, hardworking, practical and intelligent papermaker seeks connection as superintendent or manager or assistant to manager in Paper or Pulp Mill. College and University Graduate, several years' experience in Paper Mills. Member T. A. P. P. I. Well recommended, single, go anywhere. Address, Box 4221, care Paper Trade Journal. J-23

SALESMAN—Young man with eight years' sales experience selling Toilet Paper and Tissue Products and well acquainted with buyers from the Atlantic to Pacific (South of Baltimore and Frisco inclusive) desires connection with manufacturer on commission basis with weekly expense drawing account. Can handle all or any portion of this section—depending upon class of buyers you cater to. Give full particulars in first letter regarding territory open, grades of products, etc., that no unnecessary time be lost so that we may get in line for the business soon to be placed. Address, Box 4222, care Paper Trade Journal. J-9

SUPERINTENDENT desires position. 18 years' experience on Tissues, Crepe, Semi-Crepe, Toilet, Towels, Napkins and Colored Crepe Tissues, Pattern and Fruit Wraps. High grade man on Kraft and Waxing Tissue, Twine and Carpet Fillers. A1 on colors; first class references. Samples showing my work can be submitted if desired. Address, Box 3081, care Paper Trade Journal. tf

SUPERINTENDENT DESIRES POSITION. Eighteen years' experience on all the better grades of combination board and high test container. I am thoroughly familiar with all repairs and general upkeep of mill and possess a knowledge of steam and power plant operation. I can furnish the very best of references. Address, Box 4067, care Paper Trade Journal. tf

EXECUTIVE POSITION WANTED, by a man with technical and business education and training who has had extensive experience in Paper Manufacture. Address, Box 4195, care Paper Trade Journal. tf

EXPERT PAPER MILL MAINTENANCE ENGINEER. Can design, build and operate paper mills, roofing plants and machinery with guaranteed efficiency. High priced man, but worth it. Now employed but desire change. If you want your plant put on efficiency basis, let me handle it for you. Address, Box 4090, care Paper Trade Journal. tf

WANTED—Mill connections on fine and coarse papers to represent lines in New York City and vicinity. Have established trade and best of references. Address, Box 4193, care Paper Trade Journal. J-9

SALESMAN, at present employed, desires a change. Large and varied experience in High Grade Writings. Announcements and flat stock papers. Have managed one of New York's reliable paper jobbing houses for past two years. Seeking a larger field of development and recompense. Address, Box 4207, care Paper Trade Journal. J-9

PAPER CONVERTER!

MECHANICAL and PAPER ENGINEER with broad experience seeks connection with large manufacturer on development work, designing of special machinery and efficiency engineering. Will also act as Consulting Engineer on questions of machinery and manufacturing. Interviews solicited. Address, Box 4226, care Paper Trade Journal. J-23

SITUATIONS WANTED

SITUATION WANTED as machine tender in good Tissue Mill; experienced in high grade and toilet tissues on Harper and Edwards Machines. Married and Reliable; best of reference. Address, Box 4212, care Paper Trade Journal. J-9

POSITION WANTED—As Superintendent of mill making binders, leather or other boards; middle-aged man; good at construction and repairs. Address, Box 4209, care Paper Trade Journal. J-9

POSITION WANTED—With a mill or large Distributing House, position of Salesmanager or Salesman calling on Wholesale Trade. Extensive experience as an Executive. Have trained salesmen and can impart to them the necessary confidence to get business. Knowledge of making, buying and selling Twines, Cordage and Coarse Paper. Can also invest money if desired. Salary and Commission or straight salary. Address, Box 4208, care Paper Trade Journal. J-16

POSITION WANTED as superintendent of mill making binders, friction or counter boards. Good at erection and repairs. Can give best of reference. Address, Box 4163, care Paper Trade Journal. J-16

SITUATION WANTED—Inside or outside position wanted by young man, four years training inside and seven years selling including two years managerial experience. Address, Box 4197, care Paper Trade Journal. J-16

LOOK—You manufacturers of Container and other Box Boards. If you are in need of a first class practical board superintendent, who can bring your mill up to date, and make it produce what it should, why then let's get together and talk the matter over. Address, Box 4213, care Paper Trade Journal. J-23

WANTED—Situation as Master Mechanic in Paper Mill or Superintendent of Construction of new work. Have had years of experience at both branches and can give the best of references. Address, Box 4204, care Paper Trade Journal. J-23

POSITION WANTED—By practical paper maker, as assistant manager. At present employed. Understands manilas and kraft, and has had experience with ledgers and bonds. Can handle help. Address, Box 4211, care Paper Trade Journal. J-23

WANTED—Position as Machine Tender on Harper, Fourdrinier or Cylinder. Am used to most kinds of papers, also tissue. Address, Box 4206, care Paper Trade Journal. J-2

FOR SALE

FOR SALE—We offer for sale for account of foreign customer who is unable to remit on account of banking regulations, the following equipment: 1 14-9/16" Millspaugh Suction Couch Roll; 1 14-9/16" Millspaugh Suction Press Roll. Both machines having 96" width of wire 101½" between frame. The equipment absolutely new. Substantial reduction in price. The Sandusky Foundry & Machine Company, Sandusky, Ohio. J-9

FOR SALE—One 56 inch Acme Paper Cutter in perfect condition. American Seamless Container Co., St. Charles, Ill.

FOR SALE—One Gould Suction Pump, size 8 x 10, figure 1049. Two patent Hoffman couch rolls, 78 inch face, 18 inch diameter. Address, Box 4163, care Paper Trade Journal. J-9

100 TONS White Tissue Paper, 15 lb. Basis. 24x36—480. Available for immediate shipment in the following sizes: 70 tons, sheets 34¼x43¼, packed flat in cases, 15 reams per case. 25 tons, rolls 17" to 42" wide, 12" diameter, 15 lb. basis. 5 tons, 49" rolls, 12" diameter, 20 lb. basis. Write for samples and prices. Address, Box 4216, care Paper Trade Journal. J-9

FOR SALE

FOR SALE—Sheet Paper Cutter, 54 inches. Rotary Board Cutter, 48 inches. Shear Board Cutter, 48 inches. Address, Box 4210, care Paper Trade Journal. J-2

FOR SALE
FOURDRINIER PAPER MACHINE

Delivery in July

Takes wire 80 in. x 55 ft. Millspaugh suction roll, 3 presses, 24 dryers, 2 stacks late type Farrel Calender, reel, slitter, four drum Moore & White winder. Marshall drive, self-contained stand, 7" Mortise gear. Variable speed Ball Engine. Machine can be seen running at speed of 400 ft.

Frank H. Davis Company
175 Richdale Ave.
Cambridge 40 Mass.
J-9

MISCELLANEOUS

Large German Paper Factory Wants:—

REPRESENTATIVE

for North America for its pulp (Paper with Wood) printing, Prospectus and writing papers. Offers with references under A. B. 473 to Ala-Haasenstein & Vogler, Breslau (Germany).

J-9

MISCELLANEOUS

WANTED—Second-hand Slitter and Rewinder to trim 98 inches, suitable for making large diameter rolls Bag Paper. Address, Box 4219, care Paper Trade Journal. J-9

WANTED—Self-opening and Square Bag Agency for Virginia, North and South Carolina, direct from factory by a hustler who has traveled this territory continuously for 20 years and has large acquaintance and trade. Address, P. O. Box 871, Norfolk, Virginia.

SALESMAN wants to purchase an interest in New York firm dealing in high class papers. Address, Box 4225, care Paper Trade Journal. J-9

CASH PAID for old United States, Confederate and foreign postage stamps, used on letters prior to 1870. Send samples. James Hardy, 4522 Forrestville Ave., Chicago, Ill. oam-1-yr

WE WANT

Sales agency to represent manufacturer of paper or mill supplies in East or other territory. Active, experienced, financially responsible concern knowing the trade. Bank or business references. Address, Box 4229, care Paper Trade Journal. J-9.

Paper Mill Machinery For Sale

Fourdrinier Paper Machine takes wire 96" x 50'; 2 presses, 13 dryers 36" x 96", 1 stack Calenders, 4 drum winder, Marshall drive with self-contained stands, mortise gears.

Fourdrinier Paper Machine takes wire 80" x 55 ft.; 3 presses, 24 dryers, 2 stacks Calenders, Reel and 4 drum winder. Marshall drive, self contained stand, mortise gears.

Harper Fourdrinier Paper Machine takes wire 75" x 50 ft.; 2 presses, 10 dryers 48" x 68", 1 Calender, Reel, 2 drum winder, Marshall drive.

Cylinder Paper Machine, two cylinders, 2 presses, 15 dryers, 2 calenders, reel, slitter and shaft winder, Marshall drive.

Stacks of Machine Calenders: one 124", seven rolls; one 120" eight rolls; one 112" ten rolls; two 96" nine rolls; one 84" five rolls.

Beaters: Six 72" x 42" Noble & Wood; Four 66" x 42" Noble & Wood; Two 65" x 61" Dayton Iron tub; Four 61" x 60" Dayton Iron tub; One Dilts 62" x 50"; Eight Horne 36" x 36".

Jordans: One Wagg Majestic, One large Horne, Five Monarchs; Four Pony Monarchs; Two Pope Brushing Engines.

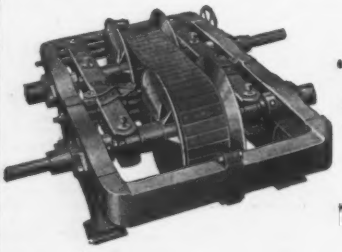
Dryers: Four 48" x 111", sixteen 48" x 106"; one 36" x 80"; ten 48" x 68"; one 84" x 67".

Press Parts: for paper machine, Pusey & Jones bell crank housings two sets 18" x 114"; four sets 18" x 110", two sets 18" x 96".

Screens: Ten 12 plate open side Packer.

Ream Cutters: One 64", one 55" Seybold, one 56" Acme.

FRANK H. DAVIS COMPANY
175 Richdale Ave., Cambridge, Mass.



"The Reeves"

VARIABLE SPEED TRANSMISSION

THE RIGHT SPEED AT THE RIGHT TIME—that is the only solution for getting superior quality and maximum production of your paper goods at the least expense.

"THE REEVES" Variable Speed Transmission does this very thing to absolute perfection; you can get any variation at any time without stopping your machine. Some decided improvements have been made in the construction of "The Reeves" Transmission, such as:

TWO KEYS, FULL LENGTH OF SHAFT between boxes, LARGER ROLLER THRUST BEARINGS, Etc.

all of which tends to give larger wearing surface, greater carrying capacity and longer life. Special High Duty Ball Bearings are furnished for main boxes if desired.

Write for bulletins T-1040 and T-1055 for complete description.

REEVES PULLEY COMPANY
COLUMBUS, INDIANA

2

"Sensation"

VOORHEES RUBBER MFG. CO. TRADE MARK

Look Into It!

Here is a belting that "stands the gaff" of high speeds and hard work.

"Sensation"

A special fabric tightly woven and a special rubber friction insures long life and practically eliminates stretch—not affected by climatic changes or frictional heat.

Here is what one mill belt expert of long experience says of it—"Instead of SENSATION being an expensive belt, it is in reality the *cheap* belt, and the so-called low priced belts are so expensive by comparison that they become a luxury."

But why not send for sample and LOOK INTO IT?

It will be a pleasure *and a profit* to do so.
Write today

Voorhees Rubber Mfg. Co.
Voorhees Block, Jersey City, N. J.

JAMES ROSENBERG, Pres. L. W. BOWMALL, Vice Pres.

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FOREIGN AND DOMESTIC
CHEMICAL and MECHANICAL WOODPULPS

Rags, New Cuttings, Bagging, Etc.
Chemicals of All Descriptions

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ESTABLISHED 1851

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Producers of the Highest Grade Brimstone on the Market . . .

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FOR SALE

FOURDRINIER PART—One 90" P & J Fourdrinier part with Millspaugh suction couch roll and pump, 40 ft. wire.

JORDANS—Several Horne and Emerson on way to our works. One Noble & Wood; two No. 1 Claflins.

KOLLERGANGS—One kollergang; size of stone 56" x 15" face.

PULLEYS—One 97" dia. x 34", double arm, modern pulley. Large cone pulleys. Large stock of iron pulleys, including some cone pulleys for Marshall drives. New wood pulleys with friction clutches. Also steel pulleys.

PUMPS—One dry suction, single vacuum, 12 x 22 x 18 Knowles; one 1,000-gallon Blake Tank Pump; several 7" and 8" Lawrence Machine Company, Class A, High Duty Pumps; Fan Pumps; new stock pumps, single and double.

PRESS ROLLS—Large number of different sizes on hand. Some suitable for rubber covering. Six rolls about 15" x 98" just received. Some brass and some rubber covered.

ROTARIES—Two 84" x 22" horizontal.

REELS—One two-bowl 58" face. Several new ones going through works. State which you desire.

RAG CUTTERS—One Daniels No. 2; one Taylor & Stiles.

SLITTERS—Two Dietz Slitters.

SCREENS—One 10-plate open side Packer with plates; one 12-plate open side Packer with practically new plates. Three Ruth centrifugal.

WINDERS—One 80" single drum P & J make; one 100" double drum, P. & J make.

Advise us of your wants.

MILLS MACHINE COMPANY
LAWRENCE, MASS.

Classified Advertising

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CAREY, JAMES L., Paper Mill Architect and Engineer, 208 North Laramie avenue, Chicago, Ill.

CHAPMAN, C. A., Inc., Paper Mill Architects and Engineers, 28 Jackson Boulevard E., Chicago, Ill.

SNOW, S. M., Mill Architect, Engineer, Paper and Pulp Mills. Steam and Water Power Plants. 55 Kilby street, Boston, Mass.

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JACOB & CO., Alexander, Wrapping, London, England. Supply all Classes Waste Papers and Shavings, Paper Making, Rags, etc. Correspondence solicited. Paris Office, 3 Cite d'Hauteville.

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ROSENBAUM, INC., L., Lafeyette street, New York City. Packers exclusively of new cuttings.

SIMMON'S, JOHN, SONS, Paper and Paper Stock, 28 and 30 South Marshall street, Philadelphia, Pa.

MISCELLANEOUS

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WILSON, H. P. & H. F., Manufacturers of Steel Wire Bale Ties, for baling all compressible material. 544 West 22nd street, New York City.

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MILLER PAPER CO., FRANK P., high grade specialties. Boards. East Downingtown, Pa.

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SWIFT, GEORGE W., JR., Designer and Manufacturer of Special Machinery for Manufacturing and Printing Paper Goods. Bordentown, N. J.

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OLD PLATES CLOSED AND RECUT

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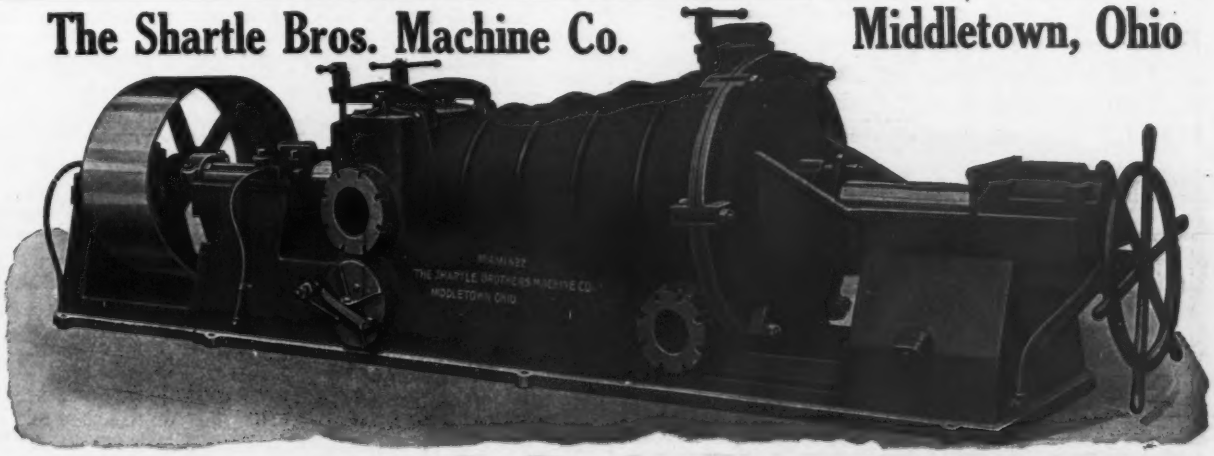
Secure Our Prices

We Can Please You

The Shartle Bros. Machine Co. Middletown, Ohio



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For the past 22 years Chief Engineer for the Pejepscot Paper Co.
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Largest Cruising House in America

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Timber and Pulp Wood Estimates.
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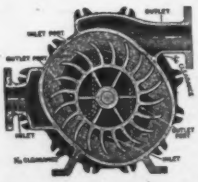

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Wilson Point Road, SOUTH NORWALK, CONN.

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SANFORD RILEY STOKER CO.
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Makers of
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MURPHY IRON WORKS
DETROIT, MICH.
Makers of
MURPHY AUTOMATIC FURNACES
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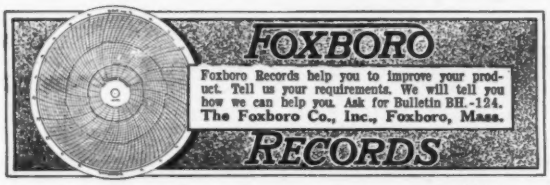
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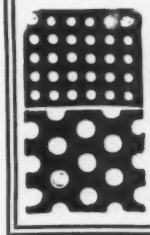
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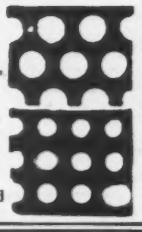

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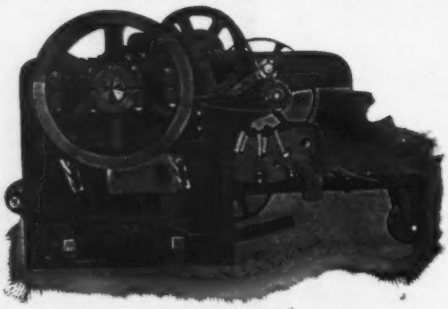

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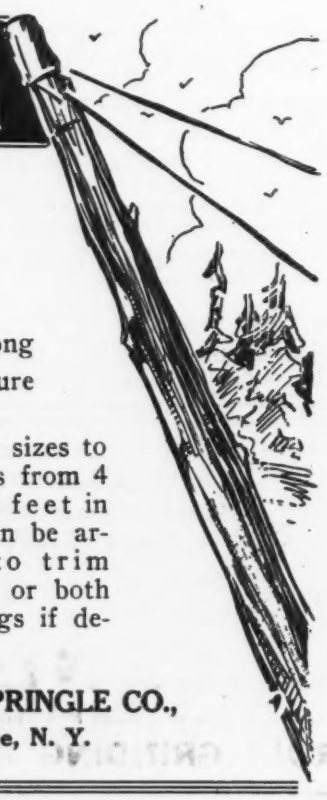

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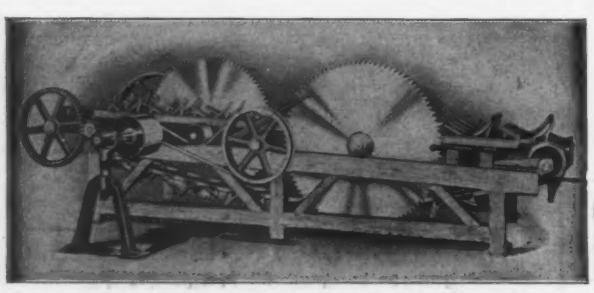

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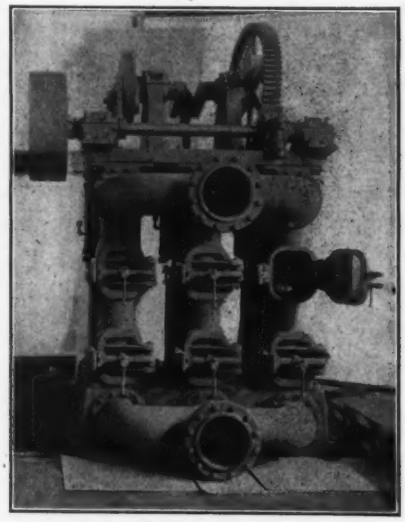

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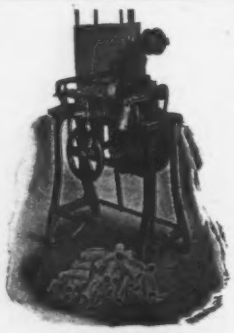

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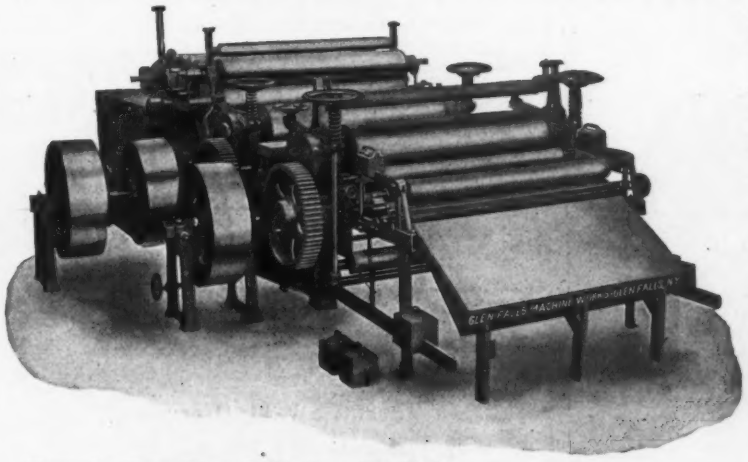

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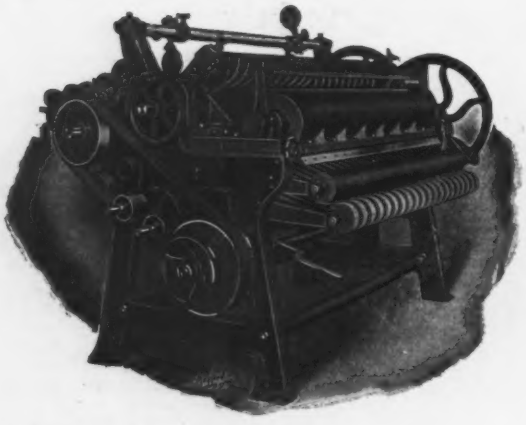

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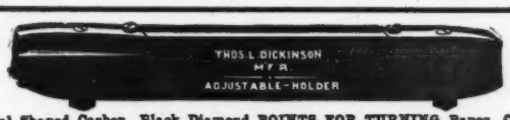

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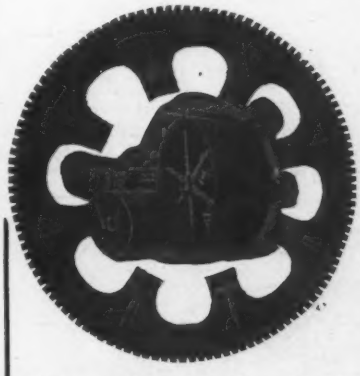

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CLASSIFIED INDEX TO ADVERTISEMENTS

ADDING MACHINE ROLLS. Page
Paper Manufacturers' Co. 115

AGALITE.
Union Talc Co. 115
U. S. Talc Co. 115

ALUM.
The Kalbfleisch Corp. ..... —
Pennsylvania Salt Mfg. Co. 116
Superior Chemical Co. 108
Winkler Bros., Inc. 108

ALUMINUM SULPHATE.
Aluminum Chemical Co. 61

ARCHITECTS AND ENGINEERS.
John F. Carrigan 104
George F. Drew 104
Hardy S. Ferguson 104
William T. Field 104
George F. Hardy 104
Herbert S. Kimball 105
Management Engineering and Development Co. 105
H. B. Prather 104
V. D. Simons 104
F. L. Smith 104
Stebbins Engineering Co. 105
Thomas L. Tomlines & Son 104
Vitale & Rothery 104
Joseph H. Wallace & Co. 104

ASBESTINE PULP.
International Pulp Co. ..... Front Cover

BALL BEARINGS.
S K F Industries, Inc. ..... —

BELT LACING (Steel).
Flexible Steel Lacing Co. ..... —

BELTING.
Cincinnati Rubber Mfg. Co. ..... —
The Rossendale-Reddaway Co. ..... —
Voorhees Rubber Mfg. Co. 102

BEATING ENGINES.
Claflin Engineering Co. ..... —
Dayton Beater & Hoist Co. 110
Dillon Machine Co. 114
Dilts Machine Works, Inc. 4
Downingtown Mfg. Co. 114
Emerson Mfg. Co. 113
Noble & Wood Machine Co. 93

BOILERS (Safety).
Heine Safety Boiler Co. 57

BRONZE ROLL JACKETS.
Sandusky Foundry & Machine Co. 110

BUCKETS (Elevator).
Hendrick Mfg. Co. 11

CALENDER ROLLS.
American Wringer Co. ..... —
Farrel Foundry & Machine Co. 107
Lobdell Car Wheel Co. 107
Norwood Engineering Co. 10
Textile Finishing Machinery Co. 105

CARBON TOOLS.
Thomas L. Dickinson 111

CASEIN.
Casein Mfg. Co. ..... —

CHEMICALS, COLORS, ETC. Page
Heller & Merz Co. 12
Kuttroff Pickhardt & Co. 102
Mathieson Alkali Works ..... —
Newport Chemical Works 7
Sandoz Chemical Works, Inc. 8
C. K. Williams & Co. 116

CLAY.
John W. Higman Co. ..... —
Miner-Edgar Co. 85
Star Clay Company 116

COGS.
N. P. Bowsher Co. 115

COMPRESSORS (Air).
Nash Engineering Co. 104

CONVEYORS.
The Jeffrey Manufacturing Co. ..... —

CORDAGE.
Columbian Rope Co. ..... —

CUTTING MACHINERY.
M. D. Knowlton Co. 108

DIE CUTTERS.
Hoggson & Pettis Mfg. Co. ..... —
Independent Die Co., Inc. 6

DIGESTERS.
Am. Welding Co. ..... —
M. W. Kellogg Co. ..... —

DRIVES (Motor).
De Laval Steam Turbine Co. ..... —
Westinghouse Elect. & Mfg. Co. ..... —

DRIVES, SILENT CHAIN.
Morse Chain Co. 115

DRYER EXHAUSTS.
Nash Engineering Co. 104

DRYING SYSTEMS.
Farnsworth Co. 71
W. F. Pickles 12

DYES, ANILINE.
Calco Chemical Co. ..... —
National Aniline & Chemical Co. 75
The White Tar Aniline Corporation ..... —

DYESTUFFS.
Columbia Dyestuffs Co. 73
E. I. du Pont de Nemours & Co. 59

ELECTRIC EQUIPMENT.
General Electric Co. ..... —

ELECTRIC HOISTS.
Shepard Electric Crane & Hoist Co. 92

ENGINEERS.
Samuel M. Green Co. 89

ENVELOPE MACHINES.
F. L. Smithe Machine Co. 4

FELTS AND JACKETS.
Albany Felt Co. 10
Appleton Woolen Mills 91
F. Bredt & Co. ..... Front Cover
Draper Bros. Co. 111
Fitchburg Duck Mills 2
F. C. Huyck & Sons 13
Knox Woolen Co. 3
Lockport Felt Co. ..... —
Orr Felt & Blanket Co. 99
Shuler-Benninghofen 116
Waterbury Felt Co. 4
Waterbury & Sons Co. 111

FILTERING SYSTEMS. Page
Norwood Engineering Co. 10

FLOOR COVERINGS.
L. Sonneborn & Sons ..... —

FOURDRINIER WIRES.
Appleton Wire Works 116
Buchanan Bolt & Wire Co. 99
Cabble Excelsior Wire Mfg. Co. 116
Cheney, Bigelow Wire Works 81
Eastwood Wire Mfg. Co. 116
Thomas E. Gleeson 3
Lindsay Wire Works 110
Jos. O'Neill Wire Works 109
The W. S. Tyler Company 108
Wisconsin Wire Works ..... —

FURNACES (Automatic).
Murphy Iron Works 104

GAUGES (Pressure, Indicating and Recording).
Manning Gauge Co. 87
The Foxboro Co., Inc. 105

KNIVES, ETC.
Bolton & Sons, J. W. 9
Dowd Knife Works ..... —
Machinery Co. of America ..... —

LUBRICANTS.
Vacuum Oil Company ..... 76 & 77

MICROMETERS.
Foreign Paper Mills, Inc. 67

MILL COGS.
N. P. Bowsher & Co. 115

MOTORS
Fairbanks-Morse & Co. ..... —

MOTOR TRUCKS.
Packard Motor Co. ..... —

PACKING.
Jenkins Bros. ..... —

PAINTS AND VARNISHES.
Du Pont de Nemours Co., E. I. ..... —

PAPER BAG MACHINERY.
Fisher Machine Co. 6
Potdevin Machine Co. 111

PAPER BAG MANUFACTURERS.
Consolidated Paper Bag Co. 99
L. Glickman & Co. 13
Schorsch & Co. 99

PAPER BOX BOARDS.
C. L. La Boiteaux Co. 9

PAPER CUTTERS.
Hamblet Machine Co. 110

PAPER DEALERS.
Dillon & Barnes 108
M. M. Elish & Co. ..... —
R. F. Hammond ..... Front Cover
Midwest Paper Co. 111

PAPER EXPORTERS.
A. M. Capen's Sons, Inc. 116
Hudson Trading Co. 2
Interstate Pulp & Paper Co. 9
Parsons Trading Co. ..... Front Cover
Parsons & Whittemore 3
W. M. Pringle Co., Inc. 67
Storm & Bull, Inc. 115

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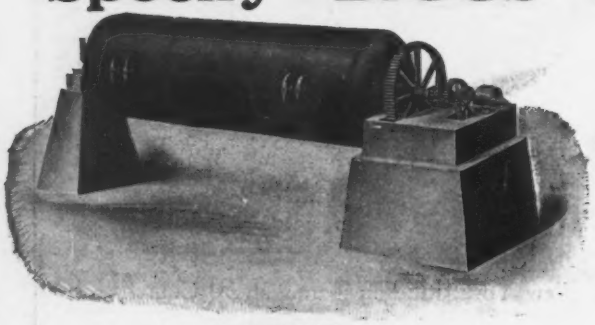

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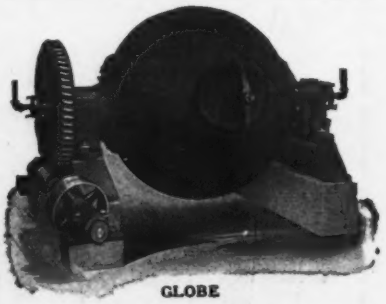

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The Biggs Boiler Works Company
AKRON, OHIO, U. S. A.

CLASSIFIED INDEX TO ADVERTISEMENTS (Continued)

PAPER MILL AGENTS. Page
Hill Company, Berton C. ... 89
Invincible Paper & Pulp Co. ... —
McIver, Dana T. ... 2
Rapp Co., Arthur R. ... 67
Sabin-Robbins Paper Co. ... —
R. L. Stevens, Jr. ... 105

PAPER AND PULP MACHINERY.
Bagley & Sewall Co. ... —
Baker Mfg. Corp. ... 93
Bird Machine Co. ... 65
Black-Clawson Co. ... 107
Clark-Aiken Co. ... 89
Frank H. Davis ... 101
Downingtown Mfg. Co. ... 115
Glens Falls Machine Works ... 109
Improved Paper Machinery Co. ... 73
M. W. Kellogg Co. ... —
Mills Machine Co. ... 103
Shartle Bros. Machine Co. ... 103
Smith & Winchester Mfg. Co. ... 115
Valley Iron Works ... —
Waterville Iron Works ... —

PAPER MANUFACTURERS.
American Coating Mills ... 11
American Writing Paper Co. ... —
Bayless Mfg. Co. ... 6
Brown Co. ... 5
Collins Mfg. Co. ... 10
Diamond Mills Paper Co. ... 90
Diamond State Fibre Co. ... Front Cover
Eastern Mfg. Co. ... 81
Eaton-Dikeman Co. ... —
Fort Howard Paper Co. ... 8
Franklin Paper Co. ... 108
Hammermill Paper Co. ... 69
Howard Paper Co. ... 87
Missisquoi Pulp & Paper Co. ... 3
Mountain Mill Paper Co. ... 67
N. Y. & Maryland Pulp & Paper Co. ... 91
Nuera Paper Co. ... 4
Orchard Paper Co. ... —
Poland Paper Co. ... —
Seaman Paper Co. ... Front Cover
Sherman Paper Co. ... 105
Stratford Paper Co. ... 113
Wausau Sulphate Fibre Co. ... —

PAPER AND PULP MILL BROKERS.
Gibbs-Brower Co. ... —

PAPER STOCK.
Atterbury Brothers ... 108
Castle, Gottheil & Overton ... 111
Gumbinsky Brothers ... 116
Hicks, Daniel M. ... 108
Francis, Hughes Co. ... 109
E. J. Keller & Co. ... 81
Mendelson Bros. Paper Stock Co. ... 112
Penn Paper & Stock Co. ... 108
Salomon Bros. & Co. ... 110
A. Salomon & Co., Inc. ... 115
Train-Smith Co. ... Front Cover

PAPER TESTERS.
Ashcroft Mfg. Co. ... 81
Foreign Paper Mills, Inc. ... 67
B. F. Perkins & Sons ... —

PAPER TUBE MACHINERY. Page
Dietz Machine Works ... 107
Grissinger Machine Works ... 108

PERFORATED METAL.
Harrington & King Perforating Co. ... 2
Hendrick Mfg. Co. ... 11
Charles Mundt & Sons ... 3
Manhattan Perforated Metal Co. ... 105

PERFORATING MACHINES.
Dietz Machine Works ... 107

PLUGS (Wood).
O. L. Bartlett ... 11

PULP PROCESS.
Castle, Gottheil & Overton ... 6

PULP STONES.
International Pulp Stone Co. ... Front Cover
Lombard & Co. ... 115

PUMPS.
Fairbanks, Morse & Co. ... 7
Frederick Iron & Steel Co. ... —
Hayton Pump & Blower Co. ... —
Worthington Pump & Machinery Corp. ... —

PUMPS (Vacuum).
Nash Engineering Company ... 104

RAG CUTTERS.
B. F. Perkins & Son, Inc. ... —
Taylor-Stiles & Co. ... 106

ROSIN SIZE.
Arabol Mfg. Co. ... 115

ROTARY BLEACHING BOILERS.
Biggs Boiler Works ... 112

SCALES
Fairbanks, Morse & Co. ... —

SCALES (Paper).
Fred Baker ... —
E. J. Cady & Co. ... —
Foreign Paper Mills, Inc. ... 67

SCREENS.
Central Mfg. Co. ... 103
Wm. A. Hardy & Sons Co. ... 87
Union Screen Plate Co. ... 109

SKYLIGHTS.
E. Van Noorden & Co. ... 4

SLASHES.
Ryther & Pringle Co. ... 106

SLITTERS AND REWINDERS.
C. Benninghofen & Sons ... 105
Cameron Machine Works ... 110
Dietz Machine Works ... 107
Samuel M. Langston Co. ... 92

STARCH.
Corn Products Refining Co. ... 9

STEAM SPECIALTIES.
Crane Co. ... 83

STITCHING MACHINERY.
Saranac Machine Co. ... 93

SULPHITE PULP ("Kraft" Soda). Page
Dryden Pulp & Paper Co., Ltd. ... —

SULPHITE BLEACHED AND UNBLEACHED.
J. Andersen & Co. ... 4 and 63
Brown Company ... 5
Craig-Becker Co., Inc. ... 8
Parsons Pulp & Lumber Co. ... 4
Pulp & Paper Trading Co. ... 4
Riordon Sales Co., Ltd. ... 97

SULPHUR.
Texas Gulf Sulphur Co. ... 13
Union Sulphur Co. ... 102

TANKS.
W. E. Caldwell Co. ... —
New England Tank & Tower Co. ... 115
Stearns Lumber Co. ... 115

TAPE MOISTENERS.
Liberty Paper Co. ... —

TEMPERATURE CONTROL.
Open Coil & Heater Co. ... —

TIMBER ESTIMATES.
R. R. Bradley ... 104
James W. Sewall ... 104

TRANSMISSION MACHINERY.
H. W. Caldwell & Sons Co. ... 111
Reeves Pulley Co. ... 102

TURBINES.
DeLaval Steam Turbine Co. ... —
S. Morgan Smith Co. ... —

TWINES.
American Manufacturing Co. ... 69

VALVES.
Crane Co. ... 83
Jenkins Bros. ... 87
Voorhees Rubber Mfg. Co. ... —

VENTILATING FANS.
B. F. Perkins & Son ... 11

VEGETABLE PARCHMENT PAPERS.
Kalamazoo Vegetable Parchment Co. ... 8

WAREHOUSE SERVICE.
Brown-Wales Co. ... 5

WAXED PAPERS.
Dragon Paper Mfg. Co. ... —

WOOD FLOUR.
Union Wood Flour Co. ... 105

WOOD PULP IMPORTERS.
American Wood Pulp Corp ... 102
J. Anderson & Co. ... 4 and 63
Ira L. Beebe & Co. ... 102
M. Gottesman & Co. ... —
Lagerloef Trading Co. ... 14 and Front Cover
New York Oversea Co., Inc. ... Front Cover
A. J. Pagel & Co., Inc. ... 55
J. F. Patton & Co., Inc. ... 91
Price & Pierce, Ltd. ... Front Cover
Scandinavian-American Trading Co. ... 12

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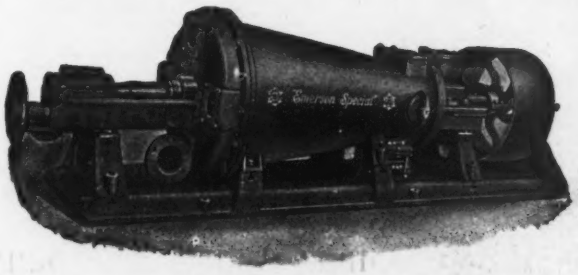

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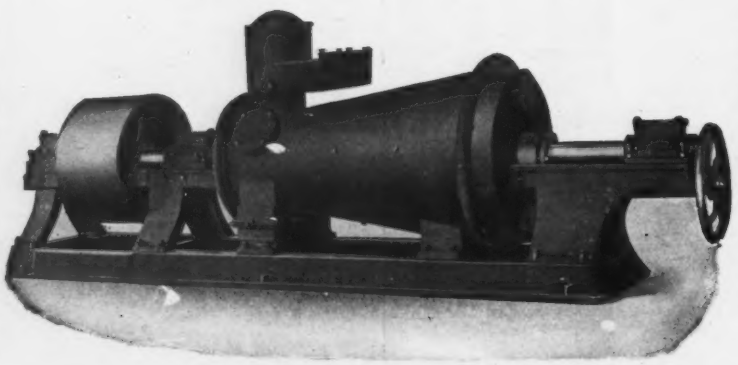

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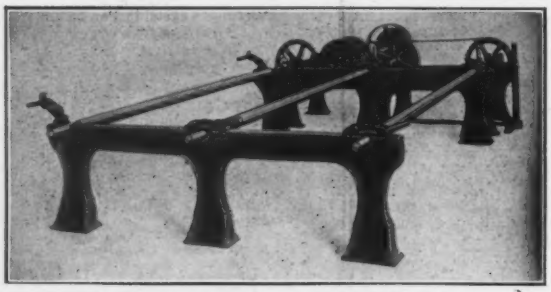

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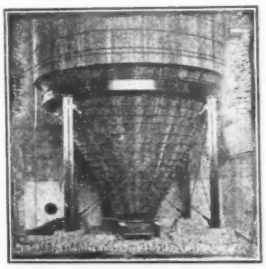

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